

**** WARNING ** WARNING ** WARNING ** WARNING ****

This document is intended for informational purposes only.

Users are cautioned that California Department of Transportation (Department) does not assume any liability or responsibility based on these electronic files or for any defective or incomplete copying, excerpting, scanning, faxing or downloading of the contract documents. As always, for the official paper versions of the bidders packages and non-bidder packages, including addenda write to the California Department of Transportation, Plans and Bid Documents, Room 0200, P.O. Box 942874, Sacramento, CA 94272-0001, telephone (916) 654-4490 or fax (916) 654-7028. Office hours are 7:30 a.m. to 4:15 p.m. When ordering bidder or non-bidder packages it is important that you include a telephone number and fax number, P.O. Box and street address so that you can receive addenda.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS
FOR CONSTRUCTION ON STATE HIGHWAY IN
THE CITY AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND**

DISTRICT 04, ROUTE 80

For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 1999, and Labor Surcharge and Equipment Rental Rates.

CONTRACT NO. 04-0120Q4

04-SF-80-12.9

Federal Aid Project

ACBRIM-080-1(098)E

**Bids Open: June 24, 2003
Dated: May 27, 2003**

OSD

IMPORTANT SPECIAL NOTICES

- DBEs must be certified by the California Unified Certification Program (CUCP). See Section 2, "Proposal Requirements and Conditions," of these special provisions for further details. The available sources for identifying certified DBEs have also been revised.
- Section 2, "Submission of DBE Information" requires DBE information to be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. To meet the DBE goal or establish that good faith efforts to meet the DBE goal have been made, bidders should ensure that all DBEs performing any work described in the contract are listed on this form, including any DBE work included in such contract items as "Mobilization," and "Time-Related Overhead."
- The time allotted for the successful bidder to execute the contract and return it, together with the contract bonds, to the Department, has been revised. See Section 3, "Award and Execution of Contract," of these special provisions. Additional time will no longer be granted for return of the executed documents.
- Attention is directed to Section 3, "Award and Execution of Contract," of the special provisions regarding the time in which the contract will be awarded.
- The bidder's attention is directed to the monthly report required in Section 5-1.14 "Monitoring," of the special provisions. The monthly report will be made available to interested local agencies. A monthly forum will be conducted by the Department at which the report will be reviewed. The Contractor is required to attend the monthly forum and present the monthly report.
- The definition of a working day has been re-defined for this project. (See Section 4 of the Special Provisions.)
- The time limit specified in the Special Provisions for the completion of work contemplated herein is considered insufficient to permit completion of the work by the Contractor working a normal number of hours per day or week on a single shift basis. It is expected that additional shifts will be required throughout the life of the contract to the extent deemed necessary to ensure that the work will be completed within the time limit specified. (See Section 4 of the Special Provisions.)

TABLE OF CONTENTS

NOTICE TO CONTRACTORS	1
SPECIAL PROVISIONS	8
SECTION 1. SPECIFICATIONS AND PLANS	8
AMENDMENTS TO JULY 1999 STANDARD SPECIFICATIONS	8
SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS	50
2-1.01 GENERAL	50
2-1.015 FEDERAL LOBBYING RESTRICTIONS	51
2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)	51
2-1.02A DBE GOAL FOR THIS PROJECT	52
2-1.02B SUBMISSION OF DBE INFORMATION	53
2-1.02C SMALL BUSINESS AND DISABLED VETERAN BUSINESS ENTERPRISE UTILIZATION AND REPORTING.....	54
2-1.03 ESCROW OF BID DOCUMENTATION	55
SECTION 3. AWARD AND EXECUTION OF CONTRACT	56
SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES	57
SECTION 5. GENERAL.....	57
SECTION 5-1. MISCELLANEOUS.....	57
5-1.01 WORKING DRAWINGS	57
5-1.011 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK	58
5-1.012 DIFFERING SITE CONDITIONS	58
5-1.013 LINES AND GRADES	59
5-1.015 LABORATORY	59
5-1.017 CONTRACT BONDS.....	59
5-1.019 COST REDUCTION INCENTIVE	59
5-1.02 LABOR NONDISCRIMINATION	59
5-1.022 PAYMENT OF WITHHELD FUNDS	59
5-1.03 INTEREST ON PAYMENTS.....	59
5-1.04 PUBLIC SAFETY	60
5-1.05 TESTING	61
5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES	61
5-1.07 YEAR 2000 COMPLIANCE	61
5-1.075 BUY AMERICA REQUIREMENTS	61
5-1.08 SUBCONTRACTOR AND DBE RECORDS	62
5-1.083 DBE CERTIFICATION STATUS.....	62
5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS	62
5-1.09 SUBCONTRACTING	63
5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS	63
5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS	63
5-1.103 RECORDS	63
5-1.11 PARTNERING	64
5-1.114 CORRIDOR VALUE ANALYSIS	64
5-1.12 PROJECT INFORMATION	65
INFORMATION HANDOUT	65
Geotechnical Materials Information.....	65
District Materials Information	65
MATERIALS INFORMATION AVAILABLE FOR INSPECTION	66
5-1.13 NON-JOURNEY PERSON TRAINING PROGRAM	66
5-1.14 MONITORING	67
5-1.15 ELECTRONIC DAILY EXTRA WORK REPORT	68
5-1.16 AREAS FOR CONTRACTOR'S USE	68
5-1.17 UTILITIES.....	69
5-1.18 SANITARY PROVISIONS	69
5-1.19 BRIDGE TOLLS	69

5-1.20 ACCESS TO PROJECT SITE	69
5-1.21 PERMITS AND LICENSES.....	69
5-1.22 PAYMENTS	69
5-1.23 SOUND CONTROL REQUIREMENTS	70
5-1.24 HAZARDOUS MATERIAL, GENERAL	70
APPLICABLE RULES AND REGULATIONS.....	71
PERMITS AND LICENSES.....	71
SITE HEALTH AND SAFETY PLAN	71
SAFETY TRAINING	71
PAYMENT.....	71
5-1.25 PHOTO IDENTIFICATION SYSTEM.....	71
5-1.26 ARCHAEOLOGICAL STUDY AREA.....	73
RESOURCE REGULATIONS AND MANDATES	73
CONSTRUCTION.....	74
5-1.27 ENVIRONMENTAL WORK RESTRICTIONS.....	74
SPECIES OF CONCERN	75
5-1.28 ENVIRONMENTALLY SENSITIVE AREAS (GENERAL)	75
5-1.29 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME	76
5-1.30 RELATIONS WITH REGIONAL WATER QUALITY CONTROL BOARD	77
5-1.31 RELATIONS WITH U.S. ARMY CORPS OF ENGINEERS	77
5-1.32 RELATIONS WITH SAN FRANCISCO BAY CONSERVATION DEVELOPMENT COMMISSION.....	77
5-1.33 RELATIONS WITH UNITED STATES COAST GUARD	78
5-1.34 RELATIONS WITH UNITED STATES FISH AND WILDLIFE SERVICE.....	78
5-1.35 RELATIONS WITH NATIONAL MARINE FISHERIES SERVICES	79
SECTION 6. (BLANK).....	79
SECTION 7. (BLANK).....	79
SECTION 8. MATERIALS.....	79
SECTION 8-1. MISCELLANEOUS.....	79
8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS.....	79
8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS	85
8-1.03 STATE-FURNISHED MATERIALS	90
8-1.04 ENGINEERING FABRICS	90
SECTION 8-2. CONCRETE.....	91
8-2.01 PORTLAND CEMENT CONCRETE	91
SECTION 8-3. WELDING	92
8-3.01 WELDING.....	92
GENERAL	92
WELDING QUALITY CONTROL.....	93
PAYMENT.....	96
SECTION 9. (BLANK).....	96
SECTION 10. CONSTRUCTION DETAILS	96
SECTION 10-1. GENERAL	96
10-1.01 ORDER OF WORK.....	96
10-1.02 TEMPORARY DRAINAGE INLET PROTECTION	96
MATERIALS	97
INSTALLATION AND MAINTENANCE.....	97
MEASUREMENT AND PAYMENT.....	98
10-1.03 WATER POLLUTION CONTROL	98
RETENTION OF FUNDS	99
STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND AMENDMENTS	100
COST BREAK-DOWN	101
SWPPP IMPLEMENTATION.....	103
MAINTENANCE.....	104
REPORTING REQUIREMENTS.....	104
SAMPLING AND ANALYTICAL REQUIREMENTS	105
PAYMENT.....	106
10-1.04 NON-STORM WATER DISCHARGES.....	107

LAND-BASED EXCAVATION DEWATERING.....	107
EFFLUENT TREATMENT FACILITY.....	110
INSPECTION.....	111
SPILL CONTINGENCY.....	111
LIQUIDS, RESIDUES AND DEBRIS.....	111
PAYMENT.....	111
10-1.05 TEMPORARY SOIL STABILIZER.....	111
MATERIALS.....	111
APPLICATION.....	112
MEASUREMENT AND PAYMENT.....	112
10-1.06 TEMPORARY COVER.....	112
MATERIALS.....	113
INSTALLATION.....	114
MAINTENANCE.....	114
MEASUREMENT AND PAYMENT.....	114
10-1.07 TEMPORARY CONCRETE WASHOUT FACILITY.....	114
MATERIALS.....	114
INSTALLATION.....	115
MAINTENANCE.....	116
PAYMENT.....	116
10-1.08 TEMPORARY SILT FENCE.....	116
MATERIALS.....	116
INSTALLATION.....	117
MAINTENANCE.....	117
MEASUREMENT AND PAYMENT.....	117
10-1.09 TEMPORARY FENCE AND GATE.....	117
10-1.10 TEMPORARY CONSTRUCTION ENTRANCE.....	118
MATERIALS.....	118
INSTALLATION.....	119
MAINTENANCE.....	119
MEASUREMENT AND PAYMENT.....	119
10-1.11 COOPERATION.....	120
10-1.12 PROGRESS SCHEDULE (CRITICAL PATH METHOD).....	121
10-1.13 TIME-RELATED OVERHEAD.....	124
10-1.14 OBSTRUCTIONS.....	126
10-1.15 ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY.....	127
DATA CONTENT REQUIREMENTS.....	127
DATA DELIVERY REQUIREMENTS.....	130
10-1.16 DUST CONTROL.....	131
10-1.17 MOBILIZATION.....	131
10-1.18 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES.....	131
10-1.19 CONSTRUCTION AREA SIGNS.....	132
10-1.20 MAINTAINING TRAFFIC.....	132
10-1.21 CLOSURE REQUIREMENTS AND CONDITIONS.....	133
CLOSURE SCHEDULE.....	133
CONTINGENCY PLAN.....	133
LATE REOPENING OF CLOSURES.....	133
COMPENSATION.....	133
10-1.22 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE.....	134
10-1.23 TEMPORARY PAVEMENT DELINEATION.....	134
GENERAL.....	134
TEMPORARY LANELINE AND CENTERLINE DELINEATION.....	135
TEMPORARY EDGELINE DELINEATION.....	135
10-1.24 CHANNELIZER.....	136
10-1.25 TEMPORARY CRASH CUSHION MODULE.....	136
10-1.26 EXISTING HIGHWAY FACILITIES.....	137
REMOVE FIRE HYDRANT.....	137
ABANDON CULVERT.....	137

ABANDON SEWER	137
ABANDON SEWER MANHOLE	138
REMOVE TRAFFIC STRIPE	138
REMOVE INLET.....	138
REMOVE ASPHALT CONCRETE DIKE.....	138
REMOVE ROADSIDE SIGN.....	138
REMOVE FENCE	138
RESET ROADSIDE SIGN	138
RELOCATE ROADSIDE SIGN.....	138
RELOCATE USCG BUOY AND BELL.....	139
ADJUST INLET	139
MODIFY INLET WITH MANHOLE FRAME AND COVER	139
RECONSTRUCT MANHOLE	139
OBLITERATE SURFACING.....	139
COLD PLANE ASPHALT CONCRETE PAVEMENT.....	139
REMOVE CONCRETE	140
10-1.27 DEMOLISH BUILDING	140
REMOVAL AND DISPOSAL OF ASBESTOS	145
LEAD ABATEMENT.....	147
10-1.28 CLEARING AND GRUBBING	149
10-1.29 EARTHWORK	149
ROADWAY EXCAVATION	149
COMPACTION	149
BACKFILL MATERIALS AT BUILDING No. 75	150
IMPORTED MATERIALS	150
HAZARDOUS MATERIAL EXCAVATION.....	150
SAMPLING AND ANALYSIS	151
SOLDIER PILE WALL EARTHWORK.....	152
10-1.30 EROSION CONTROL (NETTING).....	153
MATERIALS	153
INSTALLATION	153
MEASUREMENT AND PAYMENT.....	153
10-1.31 MOVE-IN/MOVE-OUT (EROSION CONTROL)	153
10-1.32 EROSION CONTROL (TYPE D).....	154
MATERIALS	154
APPLICATION.....	155
MEASUREMENT AND PAYMENT.....	156
10-1.33 AGGREGATE BASE	156
10-1.34 ASPHALT CONCRETE.....	157
10-1.35 SOLDIER PILE RETAINING WALL	158
10-1.36 PILING.....	158
GENERAL	158
STEEL SOLDIER PILING.....	159
MEASUREMENT AND PAYMENT (PILING).....	159
10-1.37 DRILLED HOLES.....	159
10-1.38 CONCRETE STRUCTURES	160
10-1.39 TIMBER LAGGING	160
10-1.40 ROADSIDE SIGNS.....	160
10-1.41 FIBER-OPTIC CONDUIT.....	160
10-1.42 REINFORCED CONCRETE PIPE	160
10-1.43 OVERSIDE DRAIN	161
10-1.44 MISCELLANEOUS FACILITIES	161
10-1.45 ROCK SLOPE PROTECTION.....	161
10-1.46 MISCELLANEOUS CONCRETE CONSTRUCTION.....	161
10-1.47 MISCELLANEOUS IRON AND STEEL	161
10-1.48 CHAIN LINK FENCE AND GATE (TYPE CL-2.4, BLACK VINYL-CLAD).....	161
10-1.49 DELINEATORS	161

10-1.50 METAL BEAM GUARD RAILING.....	161
TERMINAL SYSTEM (TYPE SRT).....	161
10-1.51 INSTALL FIRE HYDRANT.....	162
10-1.52 WATER MAINS.....	162
MEASUREMENT AND PAYMENT.....	168
10-1.53 VITRIFIED CLAY PIPE SEWERS.....	168
10-1.54 SANITARY SEWER MANHOLES.....	171
10-1.55 PAINT TRAFFIC STRIPE.....	172
10-1.56 PAVEMENT MARKERS.....	173
SECTION 10-2. (BLANK).....	173
SECTION 10-3. LIGHTING AND ELECTRICAL SYSTEMS.....	173
10-3.01 DESCRIPTION.....	173
10-3.02 COST BREAK-DOWN.....	173
10-3.03 FOUNDATIONS.....	173
10-3.04 SLIP BASE INSERTS.....	173
10-3.05 CONDUIT.....	174
10-3.06 PULL BOXES, SPLICES AND JUNCTION BOXES.....	174
10-3.07 CONDUCTORS AND WIRING.....	174
15 kV CABLE.....	175
OVERHEAD CABLE.....	176
10-3.08 BONDING AND GROUNDING.....	176
10-3.09 SERVICE.....	177
SERVICE EQUIPMENT ENCLOSURE (MODIFY).....	177
PAD MOUNTED TRANSFORMER.....	177
THREE PHASE MANUALLY OPERATED LOAD-INTERRUPTING FUSED SWITCH ASSEMBLY.....	179
10-3.10 NUMBERING ELECTRICAL EQUIPMENT.....	182
10-3.11 LUMINAIRES.....	182
10-3.12 SOFFIT AND WALL LUMINAIRES.....	182
10-3.13 PHOTOELECTRIC CONTROLS.....	182
10-3.14 SITE SECURITY AND CANOPY LIGHTING.....	182
Certificate Of Compliance.....	184
10-3.15 DISPOSING OF ELECTRICAL EQUIPMENT.....	184
10-3.16 PAYMENT.....	184
SECTION 11. (BLANK).....	184
SECTION 12. PREFABRICATED GUARD HOUSE AND CONCRETE CANOPY.....	184
12-1.01 PREFABRICATED GUARD HOUSE.....	184
PART 1.-GENERAL.....	184
RELATED WORK.....	184
REFERENCES.....	184
SUBMITTALS.....	185
QUALITY ASSURANCE.....	185
PART 2.-PRODUCTS.....	185
PART 3.-EXECUTION.....	186
12-1.02 CONCRETE CANOPY.....	186
RIGID ROOF INSULATION.....	186
SINGLE-PLY MEMBRANE ROOFING.....	187
SHEET METAL FLASHING.....	187
ROOF DRAINAGE PIPE.....	188
PAYMENT.....	188
FALSEWORK.....	188
12-1.03 CAST-IN-PLACE CONCRETE.....	189
PART 1.- GENERAL.....	189
SUMMARY.....	189
SUBMITTALS.....	189
QUALITY ASSURANCE.....	189
PART 2.- PRODUCTS.....	189
PAYMENT.....	195
12-1.04 SLIDING GATE.....	195

PAYMENT.....	195
SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS.....	197
FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS.....	216

STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

A10A	Abbreviations
A10B	Symbols
A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
A24B	Pavement Markings - Arrows
A24D	Pavement Markings - Words
A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
RSP A73C	Delineators, Channelizers and Barricades
A77A	Metal Beam Guard Railing – Typical Wood Post With Wood Block
A77B	Metal Beam Guard Railing - Standard Hardware
A77C	Metal Beam Guard Railing – Wood Post and Wood Block Details
A77F	Metal Beam Guard Railing – Typical Embankment Widening for End Treatments
A77FA	Metal Beam Guard Railing – Typical Line Post Installation
RSP A77G	Metal Beam Guard Railing – End Treatment, Terminal Anchor Assembly (Type SFT)
A77H	Metal Beam Guard Railing - Anchor Cable and Anchor Plate Details
RSP A77L	Metal Beam Guard Railing and Single Faced Barrier Railing Terminal System - End Treatments
A85	Chain Link Fence
A87	Curbs, Dikes and Driveways
D73	Drainage Inlets
D77A	Grate Details
D77B	Bicycle Proof Grate Details
RSP T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
T13	Traffic Control System for Lane Closure On Two Lane Conventional Highways
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4
ES-1A	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-1B	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-2C	Signal, Lighting and Electrical Systems - Service Equipment Notes, Type III Series
ES-2F	Signal, Lighting and Electrical Systems - Service Equipment and Typical Wiring Diagram Type III-C Series

ES-8	Signal, Lighting and Electrical Systems - Pull Box Details
ES-9F	Signal, Lighting and Electrical Systems - Flush Soffit Luminaire Modification Details, Structure Installations
ES-10	Signal, Lighting and Electrical Systems - Isolux Diagrams
ES-11	Signal, Lighting and Electrical Systems - Foundation Installations
ES-13A	Signal, Lighting and Electrical Systems - Splicing Details
ES-13B	Signal, Lighting and Electrical Systems - Wiring Details and Fuse Ratings

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 04-0120Q4

04-SF-80-12.9

Sealed proposals for the work shown on the plans entitled:

STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, CA 95814, until 2 o'clock p.m. on June 24, 2003, at which time they will be publicly opened and read in Room 0100 at the same address.

Proposal forms for this work are included in a separate book entitled:

STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND

General work description: Roadway to be constructed by grading and constructing asphalt concrete pavement on aggregate base, and by constructing soldier pile retaining wall, and guard house and concrete canopy.

This project has a goal of 16 percent disadvantaged business enterprise (DBE) participation.

THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991.

A prebid meeting is scheduled for 9:30 a.m. to 12:30 p.m. on June 5, 2003, at Holiday Inn, Bay Bridge, 1800 Powell Street, Emeryville, CA 94608. This meeting is to inform DBEs of subcontracting and material supply opportunities.

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a combination of Class C licenses which constitutes a majority of the work.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Prospective bidders may make arrangements to visit the project site by contacting the Duty Senior, District 04 Office, 111 Grand Avenue, Oakland, CA 94612, email: duty_senior_district04@dot.ca.gov, telephone number (510) 286-5209.

Bidder inquiries are to be submitted as follows:

For all inquiries: Duty Senior at the District 4 Office, 111 Grand Avenue, Oakland, California 94612, Fax No. (510) 622-1805, email address: duty_senior_district04@dot.ca.gov, Telephone No. (510) 286-5209.

Bidders will be requested to submit their inquiries in writing to the Oakland address, accompanied by an electronic copy where feasible, in order to avoid any misunderstandings. Written inquiries shall include the bidder's name, address and phone number. Written inquiries will be investigated and an addendum to the contract will be issued to the extent feasible and at the discretion of the Department. A copy of the responses to the bidder's inquiries and each addendum will be posted on the Internet at <http://www.dot.ca.gov/dist4/construction/inquiries/index.html>

Information handouts, as listed in various special provisions and summarized in, "Project Information," of these special provisions, are available on CD ROMs or internet websites for inspection.

The responses to bidders' inquiries, unless incorporated into formal addenda to the contract, are not a part of the contract, and are provided for the bidder's convenience only. In some instances, the question and answer may represent a summary of the matters discussed rather than a word-for-word recitation. The availability or use of information provided in the responses to bidders' inquiries is not to be construed in any way as a waiver of the provisions of Section 2-1.03 of the Standard Specifications or any other provision of the contract, the plans, Standard Specifications or Special Provisions, nor to excuse the contractor from full compliance with those contract requirements. Bidders are cautioned that subsequent responses or contract addenda may affect or vary a response previously given.

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, MS #26, Transportation Building, 1120 N Street, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications and Standard Plans are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are not available.

The successful bidder shall furnish a payment bond and a performance bond.

The Department of Transportation hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' internet web site at: <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are available through the California Department of Transportation's Electronic Project Document Distribution Site on the internet at <http://hqidoc1.dot.ca.gov/>. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

If there is a difference between the minimum wage rates predetermined by the United States Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated May 27, 2003

RMY

Contract No. 04-0120Q4

**COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)**

04-0120Q4

Item	Item Code	Item	Unit of Measure	Estimated Quantity
1	031434	ELECTRONIC MOBILE DAILY DIARY COMPUTER SYSTEM DATA DELIVERY	LS	LUMP SUM
2	070018	TIME-RELATED OVERHEAD	WDAY	146
3 (S)	031435	TEMPORARY FENCE (TYPE CL-2.4, BLACK VINYL-CLAD) WITH BARBED WIRE EXTENSION ARMS	M	435
4 (S)	031436	TEMPORARY GATE (TYPE CL-2.4, BLACK VINYL-CLAD) WITH BARBED WIRE EXTENSION ARMS	EA	2
5	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
6	074020	WATER POLLUTION CONTROL	LS	LUMP SUM
7	031437	NON-STORM WATER DISCHARGES	LS	LUMP SUM
8 (S)	074025	TEMPORARY SOIL STABILIZER	M2	2000
9 (S)	074029	TEMPORARY SILT FENCE	M	700
10 (S)	074032	TEMPORARY CONCRETE WASHOUT FACILITY	EA	1
11 (S)	074033	TEMPORARY CONSTRUCTION ENTRANCE	EA	2
12 (S)	074034	TEMPORARY COVER	M2	500
13 (S)	031438	TEMPORARY DRAINAGE INLET PROTECTION	EA	12
14	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
15 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
16	120165	CHANNELIZER (SURFACE MOUNTED)	EA	16
17	150206	ABANDON CULVERT	EA	8
18	150241	ABANDON SEWER	EA	1
19	150305	OBLITERATE SURFACING	M	2450
20 (S)	150605	REMOVE FENCE	M	200

Item	Item Code	Item	Unit of Measure	Estimated Quantity
21 (S)	150711	REMOVE PAINTED TRAFFIC STRIPE	M	195
22	150742	REMOVE ROADSIDE SIGN	EA	2
23	150771	REMOVE ASPHALT CONCRETE DIKE	M	11
24	031439	REMOVE FIRE HYDRANT	EA	1
25	150820	REMOVE INLET	EA	3
26	152316	RESET ROADSIDE SIGN (ONE POST)	EA	1
27	152390	RELOCATE ROADSIDE SIGN	EA	3
28	031440	RELOCATE USCG BUOY AND BELL	LS	LUMP SUM
29	152430	ADJUST INLET	EA	2
30	031441	MODIFY INLET WITH MANHOLE FRAME AND COVER	EA	1
31	031442	RECONSRUCT SANITARY SEWER MANHOLE	EA	3
32 (S)	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	M2	820
33	153210	REMOVE CONCRETE	M3	25
34	160101	CLEARING AND GRUBBING	LS	LUMP SUM
35 (S)	160132	DEMOLISH BUILDING	LS	LUMP SUM
36	190101	ROADWAY EXCAVATION	M3	316
37	031443	ROADWAY EXCAVATION (HAZARDOUS)	M3	568
38	031444	ROADWAY EXCAVATION (CLASS II)	M3	71
39 (F)	192049	STRUCTURE EXCAVATION (SOLDIER PILE WALL)	M3	2
40 (F)	193029	STRUCTURE BACKFILL (SOLDIER PILE WALL)	M3	30

Item	Item Code	Item	Unit of Measure	Estimated Quantity
41	198001	IMPORTED BORROW	M3	1850
42 (S)	031445	EROSION CONTROL (NETTING)	M2	2060
43 (S)	031446	STABILIZING EMULSION (EROSION CONTROL)	KG	30
44 (S)	203014	FIBER (EROSION CONTROL)	KG	125
45 (S)	203024	COMPOST (EROSION CONTROL)	KG	380
46 (S)	203026	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	2
47 (S)	203045	PURE LIVE SEED (EROSION CONTROL)	KG	25
48 (S)	208488	25 MM GATE VALVE	EA	2
49 (S)	031448	200 MM GATE VALVE	EA	1
50 (S)	031449	300 MM GATE VALVE	EA	1
51	260301	CLASS 3 AGGREGATE BASE	M3	890
52	390102	ASPHALT CONCRETE (TYPE A)	TONN	1115
53	394002	PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA)	M2	600
54	394040	PLACE ASPHALT CONCRETE DIKE (TYPE A)	M	131
55	394044	PLACE ASPHALT CONCRETE DIKE (TYPE C)	M	343
56 (F)	031450	FURNISH STEEL PILING (W360 X 32.9)	M	74
57 (S)	031451	FURNISH STEEL PILING (W360 X 51)	M	59
58 (S)	031452	FURNISH STEEL PILING (W360 X 72)	M	149
59 (F)	031453	610 MM DRILLED HOLE (SOLDIER PILES)	M	191
60 (F)	031454	CLASS 3 CONCRETE (ENCASING SOLDIER PILES)	M3	56

Item	Item Code	Item	Unit of Measure	Estimated Quantity
61 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	18
62	510526	MINOR CONCRETE (BACKFILL)	M3	12
63	566011	ROADSIDE SIGN - ONE POST	EA	3
64 (F)	575004	TIMBER LAGGING	M3	17
65 (S)	031476	FIBER OPTIC CONDUIT (2-100 MM CONCRETE ENCASED)	M	300
66	650067	300 MM REINFORCED CONCRETE PIPE	M	50
67	650068	375 MM REINFORCED CONCRETE PIPE	M	35
68	650069	450 MM REINFORCED CONCRETE PIPE	M	105
69	650072	525 MM REINFORCED CONCRETE PIPE	M	90
70	705221	375 MM CONCRETE FLARED END SECTION	EA	1
71	705223	525 MM CONCRETE FLARED END SECTION	EA	1
72	031456	300 MM VCP SANITARY SEWER PIPE	M	65
73	719200	SEWER MANHOLE	EA	1
74	721009	ROCK SLOPE PROTECTION (FACING, METHOD B)	M3	5
75	729010	ROCK SLOPE PROTECTION FABRIC	M2	10
76	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	M3	4.4
77 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	KG	1296
78 (S)	031457	CHAIN LINK FENCE (TYPE CL-2.4, BLACK VINYL-CLAD) WITH BARBED WIRE EXTENSION ARMS	M	250
79	820107	DELINEATOR (CLASS 1)	EA	24
80 (S)	832001	METAL BEAM GUARD RAILING	M	103

Item	Item Code	Item	Unit of Measure	Estimated Quantity
81 (S)	839565	TERMINAL SYSTEM (TYPE SRT)	EA	1
82 (S)	839568	TERMINAL ANCHOR ASSEMBLY (TYPE SFT)	EA	1
83 (S)	839570	RETURN SECTION	EA	1
84 (S)	840656	PAINT TRAFFIC STRIPE (2-COAT)	M	2300
85 (S)	840666	PAINT PAVEMENT MARKING (2-COAT)	M2	12
86 (S)	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	140
87 (S)	031458	LIGHTING AND ELECTRICAL SYSTEM	LS	LUMP SUM
88 (S)	031459	SITE SECURITY AND CANOPY LIGHTING	LS	LUMP SUM
89 (S)	031460	300 MM WATER DUCTILE IRON PIPE	M	10
90 (S)	031461	200 MM WATER DUCTILE IRON PIPE	M	6
91 (S)	031462	25 MM WATER GALVANIZED STEEL	M	5
92 (S)	031463	25 MM WATER COPPER	M	72
93	031464	CONCRETE CANOPY	LS	LUMP SUM
94 (S)	031465	INSTALL FIRE HYDRANT	EA	1
95 (S)	931466	PREFABRICATED GUARD HOUSE	LS	LUMP SUM
96 (S)	031467	4 M SLIDING GATE	EA	2
97	999990	MOBILIZATION	LS	LUMP SUM

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 04-0120Q4

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 1999, of the Department of Transportation insofar as the same may apply, and these special provisions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and shall be used in lieu of the conflicting portions.

**AMENDMENTS TO JULY 1999 STANDARD
SPECIFICATIONS**

UPDATED MAY 16, 2003

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the text or table following the term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

SECTION 2: PROPOSAL REQUIREMENTS AND CONDITIONS

Issue Date: June 6, 2002

Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications is amended to read:

2-1.03 Examination of Plans, Specifications, Contract, and Site of Work

- The bidder shall examine carefully the site of the work contemplated, the plans and specifications, and the proposal and contract forms therefor. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the general and local conditions to be encountered, as to the character, quality and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of the proposal, plans, specifications and the contract.

- The submission of a bid shall also be conclusive evidence that the bidder is satisfied that the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information was reasonably ascertainable from an inspection of the site and the records of exploratory work done by the Department as shown in the bid documents, as well as from the plans and specifications made a part of the contract.

- Where the Department has made investigations of site conditions including subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources, bidders or contractors may, upon written request, inspect the records of the Department as to those investigations subject to and upon the conditions hereinafter set forth.

- Where there has been prior construction by the Department or other public agencies within the project limits, records of the prior construction that are currently in the possession of the Department and which have been used by, or are

Contract No. 04-0120Q4

known to, the designers and administrators of the project will be made available for inspection by bidders or contractors, upon written request, subject to the conditions hereinafter set forth. The records may include, but are not limited to, as-built drawings, design calculations, foundation and site studies, project reports and other data assembled in connection with the investigation, design, construction and maintenance of the prior projects.

- Inspection of the records of investigations and project records may be made at the office of the district in which the work is situated, or in the case of records of investigations related to structure work, at the Transportation Laboratory in Sacramento, California.
- When a log of test borings or other record of geotechnical data obtained by the Department's investigation of surface and subsurface conditions is included with the contract plans, it is furnished for the bidders' or Contractor's information and its use shall be subject to the conditions and limitations set forth in this Section 2-1.03.
- In some instances, information considered by the Department to be of possible interest to bidders or contractors has been compiled as "Materials Information." The use of the "Materials Information" shall be subject to the conditions and limitations set forth in this Section 2-1.03 and Section 6-2, "Local Materials."
- When cross sections are not included with the plans, but are available, bidders or contractors may inspect the cross sections and obtain copies for their use, at their expense.
- When cross sections are included with the contract plans, it is expressly understood and agreed that the cross sections do not constitute part of the contract, do not necessarily represent actual site conditions or show location, character, dimensions and details of work to be performed, and are included in the plans only for the convenience of bidders and their use is subject to the conditions and limitations set forth in this Section 2-1.03.
- When contour maps were used in the design of the project, the bidders may inspect those maps, and if available, they may obtain copies for their use.
- The availability or use of information described in this Section 2-1.03 is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2-1.03 and bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to be satisfied as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality and quantity of material available from the property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the specifications.
- The Department assumes no responsibility for conclusions or interpretations made by a bidder or contractor based on the information or data made available by the Department. The Department does not assume responsibility for representation made by its officers or agents before the execution of the contract concerning surface or subsurface conditions, unless that representation is expressly stated in the contract.
- No conclusions or interpretations made by a bidder or contractor from the information and data made available by the Department will relieve a bidder or contractor from properly fulfilling the terms of the contract.

SECTION 5: CONTROL OF WORK

Issue Date: December 31, 2001

Section 5-1.02A, "Trench Excavation Safety Plans," of the Standard Specifications is amended to read:

5-1.02A Excavation Safety Plans

- The Construction Safety Orders of the Division of Occupational Safety and Health shall apply to all excavations. For all excavations 1.5 m or more in depth, the Contractor shall submit to the Engineer a detailed plan showing the design and details of the protective systems to be provided for worker protection from the hazard of caving ground during excavation. The detailed plan shall include any tabulated data and any design calculations used in the preparation of the plan. Excavation shall not begin until the detailed plan has been reviewed and approved by the Engineer.
- Detailed plans of protective systems for which the Construction Safety Orders require design by a registered professional engineer shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California, and shall include the soil classification, soil properties, soil design calculations that demonstrate adequate stability of the protective system, and any other design calculations used in the preparation of the plan.
- No plan shall allow the use of a protective system less effective than that required by the Construction Safety Orders.
- If the detailed plan includes designs of protective systems developed only from the allowable configurations and slopes, or Appendices, contained in the Construction Safety Orders, the plan shall be submitted at least 5 days before the Contractor intends to begin excavation. If the detailed plan includes designs of protective systems developed from tabulated data, or designs for which design by a registered professional engineer is required, the plan shall be submitted at least 3 weeks before the Contractor intends to begin excavation.

- Attention is directed to Section 7-1.01E, "Trench Safety."

SECTION 9: MEASUREMENT AND PAYMENT

Issue Date: November 18, 2002

Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications is amended to read:

9-1.04 NOTICE OF POTENTIAL CLAIM

- It is the intention of this section that disputes between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that the matters may be resolved, if possible, or other appropriate action promptly taken.

- Disputes will not be considered unless the Contractor has first complied with specified notice or protest requirements, including Section 4-1.03, "Changes," Section 5-1.116, "Differing Site Conditions," Section 8-1.06, "Time of Completion," Section 8-1.07, "Liquidated Damages," and Section 8-1.10, "Utility and Non-Highway Facilities."

- For disputes arising under and by virtue of the contract, including an act or failure to act by the Engineer, the Contractor shall provide a signed written initial notice of potential claim to the Engineer within 5 days from the date the dispute first arose. The initial notice of potential claim shall provide the nature and circumstances involved in the dispute which shall remain consistent through the dispute. The initial notice of potential claim shall be submitted on Form CEM-6201A furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Contractor shall assign an exclusive identification number for each dispute, determined by chronological sequencing, based on the date of the dispute.

- The exclusive identification number for each dispute shall be used on the following corresponding documents:

- A. Initial notice of potential claim.
- B. Supplemental notice of potential claim.
- C. Full and final documentation of potential claim.
- D. Corresponding claim included in the Contractor's written statement of claims.

- The Contractor shall provide the Engineer the opportunity to examine the site of work within 5 days from the date of the initial notice of potential claim. The Contractor shall proceed with the performance of contract work unless otherwise specified or directed by the Engineer.

- Throughout the disputed work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The Contractor shall allow the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim within 20 days of the date of the Engineer's written request.

- Within 15 days of submitting the initial notice of potential claim, the Contractor shall provide a signed supplemental notice of potential claim to the Engineer that provides the following information:

- A. The complete nature and circumstances of the dispute which caused the potential claim.
- B. The contract provisions that provide the basis of claim.
- C. The estimated cost of the potential claim, including an itemized breakdown of individual costs and how the estimate was determined.
- D. A time impact analysis of the project schedule that illustrates the effect on the scheduled completion date due to schedule changes or disruptions where a request for adjustment of contract time is made.

- The information provided in items A and B above shall provide the Contractor's complete reasoning for additional compensation or adjustments.

- The supplemental notice of potential claim shall be submitted on Form CEM-6201B furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Engineer will evaluate the information presented in the supplemental notice of potential claim and provide a written response to the Contractor within 20 days of its receipt. If the estimated cost or effect on the scheduled completion date changes, the Contractor shall update information in items C and D above as soon as the change is recognized and submit this information to the Engineer.

- Within 30 days of the completion of work related to the potential claim, the Contractor shall provide the full and final documentation of potential claim to the Engineer that provides the following information:

- A. A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of work affected by the dispute.
- B. The specific provisions of the contract that support the potential claim and a statement of the reasons these provisions support and provide a basis for entitlement of the potential claim.
- C. When additional monetary compensation is requested, the exact amount requested calculated in conformance with Section 9-1.03, "Force Account Payment," or Section 8-1.09, "Right of Way Delays," including an itemized breakdown of individual costs. These costs shall be segregated into the following cost categories:
 1. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, and other pertinent information related to the requested reimbursement of labor costs.
 2. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.
 3. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the affected work related to the dispute was performed.
 4. Other categories as specified by the Contractor or the Engineer.
- D. When an adjustment of contract time is requested the following information shall be provided:
 1. The specific dates for which contract time is being requested.
 2. The specific reasons for entitlement to a contract time adjustment.
 3. The specific provisions of the contract that provide the basis for the requested contract time adjustment.
 4. A detailed time impact analysis of the project schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a contract time adjustment.
- E. The identification and copies of the Contractor's documents and the substance of oral communications that support the potential claim.

- The full and final documentation of the potential claim shall be submitted on Form CEM-6201C furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655.

- Pertinent information, references, arguments, and data to support the potential claim shall be included in the full and final documentation of potential claim. Information submitted subsequent to the full and final documentation submittal will not be considered. Information required in the full and final documentation of potential claim, as listed in items A to E above, that is not applicable to the dispute may be exempted as determined by the Engineer. No full and final documentation of potential claim will be considered that does not have the same nature and circumstances, and basis of claim as those specified on the initial and supplemental notices of potential claim.

- The Engineer will evaluate the information presented in the full and final documentation of potential claim and provide a written response to the Contractor within 30 days of its receipt unless otherwise specified. The Engineer's receipt of the full and final documentation of potential claim shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand. If the full and final documentation of potential claim is submitted by the Contractor after acceptance of the work by the Director, the Engineer need not provide a written response.

- Provisions in this section shall not apply to those claims for overhead costs and administrative disputes that occur after issuance of the proposed final estimate. Administrative disputes are disputes of administrative deductions or retentions, contract item quantities, contract item adjustments, interest payments, protests of contract change orders as provided in Section 4-1.03A, "Procedure and Protest," and protests of the weekly statement of working days as provided in Section 8-1.06, "Time of Completion." Administrative disputes that occur prior to issuance of the proposed final estimate shall follow applicable requirements of this section. Information listed in the supplemental notice and full and final documentation of potential claim that is not applicable to the administrative dispute may be exempted as determined by the Engineer.

- Unless otherwise specified in the special provisions, the Contractor may pursue the administrative claim process pursuant to Section 9-1.07B, "Final Payment and Claims," for any potential claim found by the Engineer to be without merit.

- Failure of the Contractor to conform to specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract, and is deemed as the Contractor's waiver of the potential claim and a waiver of the right to a corresponding claim for the disputed work in the administrative claim process in conformance with

Section 9-1.07B, "Final Payment of Claims," and shall operate as a bar to arbitration pursuant to Section 10240.2 of the California Public Contract Code.

Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications is amended to read:

9-1.07B Final Payment and Claims

- After acceptance by the Director, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including an itemization of the total amount, segregated by contract item quantities, extra work and other bases for payment, and shall also show each deduction made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. Prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of claims arising under or by virtue of the contract so that the Engineer receives the written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of the written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. The Contractor's receipt of the proposed final estimate shall be evidenced by postal receipt. The Engineer's receipt of the Contractor's written approval or statement of claims shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand.

- On the Contractor's approval, or if the Contractor files no claim within the specified period of 30 days, the Engineer will issue a final estimate in writing in conformance with the proposed final estimate submitted to the Contractor, and within 30 days thereafter the State will pay the entire sum so found to be due. That final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

- If the Contractor within the specified period of 30 days files claims, the Engineer will issue a semifinal estimate in conformance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the sum found to be due. The semifinal estimate and corresponding payment shall be conclusive and binding against both parties to the contract on each question relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

- Except for claims for overhead costs and administrative disputes that occur after issuance of the proposed final estimate, the Contractor shall only provide the following two items of information for each claim:

- A. The exclusive identification number that corresponds to the supporting full and final documentation of potential claim.
- B. The final amount of requested additional compensation.

- If the final amount of requested additional compensation is different than the amount of requested compensation included in the full and final documentation of potential claim, the Contractor shall provide in the written statement of claims the reasons for the changed amount, the specific provisions of the contract which support the changed amount, and a statement of the reasons the provisions support and provide a basis for the changed amount. If the Contractor's claim fails to provide an exclusive identification number or if there is a disparity in the provided exclusive identification number, the Engineer will notify the Contractor of the omission or disparity. The Contractor shall have 15 days after receiving notification from the Engineer to correct the omission or disparity. If after the 15 days has elapsed, there is still an omission or disparity of the exclusive identification number assigned to the claim, the Engineer will assign the number. No claim will be considered that has any of the following deficiencies:

- A. The claim does not have the same nature, circumstances, and basis as the corresponding full and final documentation of potential claim.
- B. The claim does not have a corresponding full and final documentation of potential claim.
- C. The claim was not included in the written statement of claims.
- D. The Contractor did not comply with applicable notice or protest requirements of Sections 4-1.03, "Changes," 5-1.116, "Differing Site Condition," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," 8-1.10, "Utility and Non-Highway Facilities," and 9-1.04, "Notice of Potential Claim."

- Administrative disputes that occur after issuance of the proposed final estimate shall be included in the Contractor's written statement of claims in sufficient detail to enable the Engineer to ascertain the basis and amounts of those claims.

- The Contractor shall keep full and complete records of the costs and additional time incurred for work for which a claim for additional compensation is made. The Engineer or designated claim investigators or auditors shall have access to

those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to those records shall be sufficient cause for denying the claims.

• The written statement of claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code Section 12650 et. seq., the undersigned,

(name) _____ of

(title) _____

(company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

Dated _____
/s/ _____
Subscribed and sworn before me this _____ day
of _____

(Notary Public)
My Commission
Expires _____

• Failure to submit the notarized certificate will be sufficient cause for denying the claim.
• Claims for overhead type expenses or costs, in addition to being certified as stated above, shall be supported and accompanied by an audit report of an independent Certified Public Accountant. Omission of a supporting audit report of an independent Certified Public Accountant shall result in denial of the claim and shall operate as a bar to arbitration, as to the claim, in conformance with the requirements in Section 10240.2 of the California Public Contract Code. Claims for overhead type expenses or costs shall be subject to audit by the State at its discretion. The costs of performing an audit examination and submitting the report shall be borne by the Contractor. The Certified Public Accountant's audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude unallowable costs as determined in Title 48 of the Federal Acquisition Regulations, Chapter 1, Part 31. The audit examination and report shall determine if the rates of field and home office overhead are:

- A. Allowable in conformance with the requirements in Title 48 of the Federal Acquisition Regulations, Chapter 1, Part 31.
- B. Adequately supported by reliable documentation.
- C. Related solely to the project under examination.

• Costs or expenses incurred by the State in reviewing or auditing claims that are not supported by the Contractor's cost accounting or other records shall be deemed to be damages incurred by the State within the meaning of the California False Claims Act.

• If the Contractor files a timely written statement of claims in response to the proposed final estimate, the District that administers the contract will submit a claim position letter to the Contractor by hand delivery or deposit in the U.S. mail within 135 days of acceptance of the contract. The claim position letter will delineate the District's position on the Contractor's claims. If the Contractor disagrees with the claim position letter, the Contractor shall submit a written notification of its disagreement and a written request to meet with the board of review, to be received by the District not later

than 15 days after the Contractor's receipt of the claim position letter. The written notification of disagreement shall set forth the basis for the Contractor's disagreement and be submitted to the office designated in the claim position letter. The Contractor's failure to provide a timely written notification of disagreement or timely written request to meet with the board of review shall constitute the Contractor's acceptance and agreement with the determinations provided in the claim position letter and with final payment pursuant to the claim position letter.

- If the Contractor files a timely notification of disagreement with the District claim position letter and a timely request to meet with the board of review, then the board of review, designated by the District Director to review claims that remain in dispute, will meet with the Contractor within 45 days after receipt by the District of the notification of disagreement.
- If the District fails to submit a claim position letter to the Contractor within 135 days after the acceptance of the contract and the Contractor has claims that remain in dispute, the Contractor may request a meeting with the board of review designated by the District Director to review claims that remain in dispute. The Contractor's request for a meeting shall identify the claims that remain in dispute. If the Contractor files a request for a meeting, the board of review will meet with the Contractor within 45 days after the District receives the request for the meeting.
- Attendance by the Contractor at the board of review meeting shall be mandatory. The board of review will review those claims and make a written recommendation thereon to the District Director. The final determination of claims, made by the District Director, will be sent to the Contractor by hand delivery or deposit in the U.S. mail. The Engineer will then make and issue the Engineer's final estimate in writing and within 30 days thereafter the State will pay the entire sum, if any, found due thereon. That final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."
- Failure of the Contractor to conform to the specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract and shall operate as a bar to arbitration in conformance with the requirements in Section 10240.2 of the California Public Contract Code.

SECTION 19: EARTHWORK

Issue Date: December 31, 2001

The third paragraph of Section 19-1.02, "Preservation of Property," of the Standard Specifications is amended to read:

- In addition to the provisions in Sections 5-1.02, "Plans and Working Drawings," and 5-1.02A, "Excavation Safety Plans," detailed plans of the protective systems for excavations on or affecting railroad property will be reviewed for adequacy of protection provided for railroad facilities, property, and traffic. These plans shall be submitted at least 9 weeks before the Contractor intends to begin excavation requiring the protective systems. Approval by the Engineer of the detailed plans for the protective systems will be contingent upon the plans being satisfactory to the railroad company involved.

SECTION 42: GROOVE AND GRIND PAVEMENT

Issue Date: December 31, 2001

The last sentence of the first subparagraph of the third paragraph in Section 42-2.02, "Construction," of the Standard Specifications is amended to read:

After grinding has been completed, the pavement shall conform to the straightedge and profile requirements specified in Section 40-1.10, "Final Finishing."

SECTION 49: PILING

Issue Date: April 30, 2003

The first paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

- Foundation piles of any material shall be of such length as is required to develop the nominal resistance, to obtain the specified penetration, and to extend into the cap or footing block as shown on the plans, or specified in the special provisions.

The fourth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

- Modification to the specified installation methods and specified pile tip elevation will not be considered at locations where tension or lateral load demands control design pile tip elevations or when the plans state that specified pile tip elevation shall not be revised.

The sixth and seventh paragraphs in Section 49-1.03, "Determination of Length," of the Standard Specifications are amended to read:

- Indicator compression pile load testing shall conform to the requirements in ASTM Designation: D 1143. The pile shall sustain the first compression test load applied which is equal to the nominal resistance in compression, as shown on the plans, with no more than 13 mm total vertical movement at the top of the pile measured relative to the top of the pile prior to the start of compression load testing.
- Indicator tension pile load testing shall conform to the requirements in ASTM Designation: D 3689. The loading apparatus described as "Load Applied to Pile by Hydraulic Jack(s) Acting at One End of Test Beam(s) Anchored to the Pile" shall not be used. The pile shall sustain the first tension test load applied which is equal to the nominal resistance in tension, as shown on the plans, with no more than 13 mm total vertical movement at the top of the pile measured relative to the top of the pile prior to the start of tension load testing.

The ninth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is amended to read:

- For driven piling, the Contractor shall furnish piling of sufficient length to obtain both the specified tip elevation and nominal resistance shown on the plans or specified in the special provisions. For cast-in-drilled-hole concrete piling, the Contractor shall construct piling of such length to develop the nominal resistance in compression and to obtain the specified tip elevation shown on the plans or specified in the special provisions.

The tenth paragraph in Section 49-1.03, "Determination of Length," of the Standard Specifications is deleted.

The fourth paragraph in Section 49-1.04, "Load Test Piles," of the Standard Specifications is amended to read:

- Load test piles and anchor piles which are not to be incorporated in the completed structure shall be removed in conformance with the provisions in Section 15-4.02, "Removal Methods," and the remaining holes shall be backfilled with earth or other suitable material approved by the Engineer.

The first paragraph in Section 49-1.05, "Driving Equipment," of the Standard Specifications is amended to read:

- Driven piles shall be installed with impact hammers that are approved in writing by the Engineer. Impact hammers shall be steam, hydraulic, air or diesel hammers. Impact hammers shall develop sufficient energy to drive the piles at a penetration rate of not less than 3 mm per blow at the specified nominal resistance.

The seventh paragraph in Section 49-1.05, "Driving Equipment," of the Standard Specifications is amended to read:

- When necessary to obtain the specified penetration and when authorized by the Engineer, the Contractor may supply and operate one or more water jets and pumps, or furnish the necessary drilling apparatus and drill holes not greater than the least dimension of the pile to the proper depth and drive the piles therein. Jets shall not be used at locations where the stability of embankments or other improvements would be endangered. In addition, for steel piles, steel shells, or steel casings, when necessary to obtain the specified penetration or to prevent damage to the pile during installation, the Contractor shall provide special driving tips or heavier pile sections or take other measures as approved by the Engineer.
- The use of followers or underwater hammers for driving piles will be permitted if authorized in writing by the Engineer. When a follower or underwater hammer is used, its efficiency shall be verified by furnishing the first pile in each bent or footing sufficiently long and driving the pile without the use of a follower or underwater hammer.

The second paragraph in Section 49-1.07, "Driving," of the Standard Specifications is amended to read:

- Timber piles shall be fresh-headed and square and when permitted by the Engineer, the heads of the piles may be protected by means of heavy steel or wrought iron rings. During driving operations timber piling shall be restrained from lateral movement at intervals not to exceed 6 m over the length between the driving head and the ground surface. During

driving operations, the timber pile shall be kept moving by continuous operation of the hammer. When the blow count exceeds either 2 times the blow count required in 300 mm, or 3 times the blow count required in 75 mm for the nominal resistance as shown on the plans, computed in conformance with the provisions in Section 49-1.08, "Pile Driving Acceptance Criteria," additional aids shall be used to obtain the specified penetration. These aids may include the use of water jets or drilling, where permitted, or the use of a larger hammer employing a heavy ram striking with a low velocity.

Section 49-1.08, "Bearing Value and Penetration," of the Standard Specifications is amended to read:

49-1.08 PILE DRIVING ACCEPTANCE CRITERIA

- Except for piles to be load tested, driven piles shall be driven to a value of not less than the nominal resistance shown on the plans unless otherwise specified in the special provisions or permitted in writing by the Engineer. In addition, when a pile tip elevation is specified, driven piles shall penetrate at least to the specified tip elevation, unless otherwise permitted in writing by the Engineer. Piles to be load tested shall be driven to the specified tip elevation.
- When the pile nominal resistance is omitted from the plans or the special provisions, timber piles shall be driven to a nominal resistance of 800 kN, and steel and concrete piles shall be driven to a nominal resistance of 1250 kN.
- The nominal resistance for driven piles shall be determined from the following formula in which " R_u " is the nominal resistance in kilonewtons, " E_r " is the manufacturer's rating for joules of energy developed by the hammer at the observed field drop height, and "N" is the number of hammer blows in the last 300 millimeters. (maximum value to be used for N is 100):

$$R_u = (7 * (E_r)^{1/2} * \log_{10} (0.83 * N)) - 550$$

Section 49-3.01, "Description," of the Standard Specifications is amended by deleting the fifth paragraph.

The sixth paragraph in Section 49-4.01, "Description," of the Standard Specifications is amended to read:

- Lifting anchors used in precast prestressed concrete piles without a class designation ending in "C" (corrosion resistant) shall be removed, and the holes filled in conformance with the provisions in Section 51-1.18A, "Ordinary Surface Finish."

The first and second paragraphs in Section 49-4.01, "Description," of the Standard Specifications are amended to read:

- Cast-in-place concrete piles shall consist of one of the following:
 - A. Steel shells driven permanently to the required nominal resistance and penetration and filled with concrete.
 - B. Steel casings installed permanently to the required penetration and filled with concrete.
 - C. Drilled holes filled with concrete.
 - D. Rock sockets filled with concrete.

- The drilling of holes shall conform to the provisions in these specifications. Concrete filling for cast-in-place concrete piles is designated by compressive strength and shall have a minimum 28-day compressive strength of 25 MPa. At the option of the Contractor, the combined aggregate grading for the concrete shall be either the 25-mm maximum grading, the 12.5-mm maximum grading, or the 9.5-mm maximum grading. Concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," and Section 51, "Concrete Structures." Reinforcement shall conform to the provisions in Section 52, "Reinforcement."

The fourth paragraph in Section 49-4.03, "Drilled Holes," of the Standard Specifications is amended to read:

- After placing reinforcement and prior to placing concrete in the drilled hole, if caving occurs or deteriorated foundation material accumulates on the bottom of the hole, the bottom of the drilled hole shall be cleaned. The Contractor shall verify that the bottom of the drilled hole is clean.

The first and second paragraphs in Section 49-4.04, "Steel Shells," of the Standard Specifications are amended to read:

- Steel shells shall be sufficiently watertight to exclude water during the placing of concrete. The shells may be cylindrical or tapered, step-tapered, or a combination of either, with cylindrical sections.

The first paragraph in Section 49-4.05, "Inspection," of the Standard Specifications is amended to read:

- After being driven and prior to placing reinforcement and concrete therein, the steel shells shall be examined for collapse or reduced diameter at any point. Any shell which is improperly driven or broken or shows partial collapse to such an extent as to materially decrease its nominal resistance will be rejected. Rejected shells shall be removed and replaced, or a new shell shall be driven adjacent to the rejected shell. Rejected shells which cannot be removed shall be filled with concrete by the Contractor at the Contractor's expense. When a new shell is driven to replace a rejected shell, the Contractor, at the Contractor's expense, shall enlarge the footing as determined necessary by the Engineer.

The third paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- The contract price paid per meter for cast-in-drilled-hole concrete piling shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in drilling holes, disposing of material resulting from drilling holes, temporarily casing holes and removing water when necessary, furnishing and placing concrete and reinforcement, and constructing reinforced concrete extensions, complete in place, to the required penetration, as shown on the plans, as specified in these specifications and in the special provisions, and as directed by the Engineer.

The seventh paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read

- The contract unit price paid for drive pile shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in driving timber, concrete and steel piles, driving steel shells for cast-in-place concrete piles, placing filling materials for cast-in-place concrete piles and cutting off piles, all complete in place to the required nominal resistance and penetration as shown on the plans and as specified in these specifications and the special provisions, and as directed by the Engineer.

The ninth paragraph in Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- Full compensation for all jetting, drilling, providing special driving tips or heavier sections for steel piles or shells, or other work necessary to obtain the specified penetration and nominal resistance of the piles, for predrilling holes through embankment and filling the space remaining around the pile with sand or pea gravel, for disposing of material resulting from jetting, drilling or predrilling holes, and for all excavation and backfill involved in constructing concrete extensions as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer shall be considered as included in the contract unit price paid for drive pile or in the contract price paid per meter for cast-in-drilled-hole concrete piling, and no additional compensation will be allowed therefor.

Section 49-6.02, "Payment," of the Standard Specifications is amended by adding the following paragraphs:

Full compensation for furnishing and placing additional testing reinforcement, for load test anchorages, and for cutting off test piles, shall be considered as included in the contract price paid for piling of the type or class shown in the Engineer's Estimate, and no additional compensation will be allowed.

No additional compensation or extension of time will be made for additional foundation investigation, installation and testing of indicator piling, cutting off piling and restoring the foundation investigation and indicator pile sites, and review of request by the Engineer

SECTION 50: PRESTRESSING CONCRETE

Issue Date: November 18, 2002

Section 50-1.02, "Drawings," of the Standard Specifications is amended by adding the following paragraph after the second paragraph:

- Each working drawing submittal shall consist of plans for a single bridge or portion thereof. For multi-frame bridges, each frame shall require a separate working drawing submittal.

Section 50-1.05, "Prestressing Steel," of the Standard Specifications is amended to read:

- Prestressing steel shall be high-tensile wire conforming to the requirements in ASTM Designation: A 421, including Supplement I; high-tensile seven-wire strand conforming to the requirements in ASTM Designation: A 416; or uncoated high-strength steel bars conforming to the requirements in ASTM Designation: A 722, including all supplementary requirements. The maximum mass requirement of ASTM Designation: A 722 will not apply.

- In addition to the requirements of ASTM Designation: A 722, for deformed bars, the reduction of area shall be determined from a bar from which the deformations have been removed. The bar shall be machined no more than necessary to remove the deformations over a length of 300 mm, and reduction will be based on the area of the machined portion.

- In addition to the requirements specified herein, epoxy-coated seven-wire prestressing steel strand shall be grit impregnated and filled in conformance with the requirements in ASTM Designation: A 882/A 882M, including Supplement I, and the following:

- A. The coating material shall be on the Department's list of approved coating materials for epoxy-coated strand, available from the Transportation Laboratory.
- B. The film thickness of the coating after curing shall be 381 μm to 1143 μm .
- C. Prior to coating the strand, the Contractor shall furnish to the Transportation Laboratory a representative 230-g sample from each batch of epoxy coating material to be used. Each sample shall be packaged in an airtight container identified with the manufacturer's name and batch number.
- D. Prior to use of the epoxy-coated strand in the work, written certifications referenced in ASTM Designation: A 882/A 882M, including a representative load-elongation curve for each size and grade of strand to be used and a copy of the quality control tests performed by the manufacturer, shall be furnished to the Engineer.
- E. In addition to the requirements in Section 50-1.10, "Samples for Testing," four 1.5-m long samples of coated strand and one 1.5-m long sample of uncoated strand of each size and reel shall be furnished to the Engineer for testing. These samples, as selected by the Engineer, shall be representative of the material to be used in the work.
- F. Epoxy-coated strand shall be cut using an abrasive saw.
- G. All visible damage to coatings caused by shipping and handling, or during installation, including cut ends, shall be repaired in conformance with the requirements in ASTM Designation: A 882/A 882M. The patching material shall be furnished by the manufacturer of the epoxy powder and shall be applied in conformance with the manufacturer's written recommendations. The patching material shall be compatible with the original epoxy coating material and shall be inert in concrete.

- All bars in any individual member shall be of the same grade, unless otherwise permitted by the Engineer.

- When bars are to be extended by the use of couplers, the assembled units shall have a tensile strength of not less than the manufacturer's minimum guaranteed ultimate tensile strength of the bars. Failure of any one sample to meet this requirement will be cause for rejection of the heat of bars and lot of couplers. The location of couplers in the member shall be subject to approval by the Engineer.

- Wires shall be straightened if necessary to produce equal stress in all wires or wire groups or parallel lay cables that are to be stressed simultaneously or when necessary to ensure proper positioning in the ducts.

- Where wires are to be button-headed, the buttons shall be cold formed symmetrically about the axes of the wires. The buttons shall develop the minimum guaranteed ultimate tensile strength of the wire. No cold forming process shall be used that causes indentations in the wire. Buttonheads shall not contain wide open splits, more than 2 splits per head, or splits not parallel with the axis of the wire.

- Prestressing steel shall be protected against physical damage and rust or other results of corrosion at all times from manufacture to grouting or encasing in concrete. Prestressing steel that has sustained physical damage at any time shall be rejected. The development of visible rust or other results of corrosion shall be cause for rejection, when ordered by the Engineer.

- Epoxy-coated prestressing steel strand shall be covered with an opaque polyethylene sheeting or other suitable protective material to protect the strand from exposure to sunlight, salt spray, and weather. For stacked coils, the protective covering shall be draped around the perimeter of the stack. The covering shall be adequately secured; however, it should allow for air circulation around the strand to prevent condensation under the covering. Epoxy-coated strand shall not be stored within 300 m of ocean or tidal water for more than 2 months.

- Prestressing steel shall be packaged in containers or shipping forms for the protection of the steel against physical damage and corrosion during shipping and storage. Except for epoxy-coated strand, a corrosion inhibitor which prevents rust or other results of corrosion, shall be placed in the package or form, or shall be incorporated in a corrosion inhibitor carrier type packaging material, or when permitted by the Engineer, may be applied directly to the steel. The corrosion inhibitor shall have no deleterious effect on the steel or concrete or bond strength of steel to concrete. Packaging or forms damaged from any cause shall be immediately replaced or restored to original condition.

- The shipping package or form shall be clearly marked with a statement that the package contains high-strength prestressing steel, and the type of corrosion inhibitor used, including the date packaged.

- Prestressing steel for post-tensioning which is installed in members prior to placing and curing of the concrete, and which is not epoxy-coated, shall be continuously protected against rust or other results of corrosion, until grouted, by means of a corrosion inhibitor placed in the ducts or applied to the steel in the duct. The corrosion inhibitor shall conform to the provisions specified herein.

- When steam curing is used, prestressing steel for post-tensioning shall not be installed until the steam curing is completed.

- Water used for flushing ducts shall contain either quick lime (calcium oxide) or slaked lime (calcium hydroxide) in the amount of 0.01-kg/L. Compressed air used to blow out ducts shall be oil free.

- When prestressing steel for post-tensioning is installed in the ducts after completion of concrete curing, and if stressing and grouting are completed within 10 days after the installation of the prestressing steel, rust which may form during those 10 days will not be cause for rejection of the steel. Prestressing steel installed, tensioned, and grouted in this manner, all within 10 days, will not require the use of a corrosion inhibitor in the duct following installation of the prestressing steel. Prestressing steel installed as above but not grouted within 10 days shall be subject to all the requirements in this section pertaining to corrosion protection and rejection because of rust. The requirements in this section pertaining to tensioning and grouting within 10 days shall not apply to epoxy-coated prestressing steel strand.

- Any time prestressing steel for pretensioning is placed in the stressing bed and is exposed to the elements for more than 36 hours prior to encasement in concrete, adequate measures shall be taken by the Contractor, as approved by the Engineer, to protect the steel from contamination or corrosion.

- After final fabrication of the seven-wire prestressing steel strand, no electric welding of any form shall be performed on the prestressing steel. Whenever electric welding is performed on or near members containing prestressing steel, the welding ground shall be attached directly to the steel being welded.

- Pretensioned prestressing steel shall be cut off flush with the end of the member. For epoxy-coated prestressing steel, only abrasive saws shall be used to cut the steel. The exposed ends of the prestressing steel and a 25-mm strip of adjoining concrete shall be cleaned and painted. Cleaning shall be by wire brushing or abrasive blast cleaning to remove all dirt and residue on the metal or concrete surfaces. Immediately after cleaning, the surfaces shall be covered with one application of unthinned zinc-rich primer (organic vehicle type) conforming to the provisions in Section 91, "Paint," except that 2 applications shall be applied to surfaces which will not be covered by concrete or mortar. Aerosol cans shall not be used. The paint shall be thoroughly mixed at the time of application and shall be worked into any voids in the prestressing tendons.

The thirteenth paragraph in Section 50-1.08, "Prestressing," of the Standard Specifications is amended to read:

- Prestressing steel in pretensioned members shall not be cut or released until the concrete in the member has attained a compressive strength of not less than the value shown on the plans or 28 MPa, whichever is greater. In addition to these concrete strength requirements, when epoxy-coated prestressing steel strand is used, the steel shall not be cut or released until the temperature of the concrete surrounding the strand is less than 65°C, and falling.

The fifth paragraph in Section 50-1.10, "Samples for Testing," of the Standard Specifications is amended to read:

- The following samples of materials and tendons, selected by the Engineer from the prestressing steel at the plant or jobsite, shall be furnished by the Contractor to the Engineer well in advance of anticipated use:

- A. For wire or bars, one 2-m long sample and for strand, one 1.5-m long sample, of each size shall be furnished for each heat or reel.

- B. For epoxy-coated strand, one 1.5-m long sample of uncoated strand of each size shall be furnished for each reel.

- C. If the prestressing tendon is a bar, one 2-m long sample shall be furnished and in addition, if couplers are to be used with the bar, two 1.25-m long samples of bar, equipped with one coupler and fabricated to fit the coupler, shall be furnished.

The second paragraph in Section 50-1.11, "Payment," of the Standard Specifications is amended to read:

- The contract lump sum prices paid for prestressing cast-in-place concrete of the types listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing, placing, and tensioning the prestressing steel in cast-in-place concrete structures, complete in place, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

SECTION 51: CONCRETE STRUCTURES

Issue Date: April 16, 2003

The first and second paragraph in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications are amended to read:

- The Contractor shall submit to the Engineer working drawings and design calculations for falsework proposed for use at bridges. For bridges where the height of any portion of the falsework, as measured from the ground line to the soffit of the superstructure, exceeds 4.25 m; or where any individual falsework clear span length exceeds 4.85 m; or where provision for vehicular, pedestrian, or railroad traffic through the falsework is made; the drawings shall be signed by an engineer who is registered as a Civil Engineer in the State of California. Six sets of the working drawings and 2 copies of the design calculations shall be furnished. Additional working drawings and design calculations shall be submitted to the Engineer when specified in "Railroad Relations and Insurance" of the special provisions.
- The falsework drawings shall include details of the falsework erection and removal operations showing the methods and sequences of erection and removal and the equipment to be used. The details of the falsework erection and removal operations shall demonstrate the stability of all or any portions of the falsework during all stages of the erection and removal operations.

The seventh paragraph in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended to read:

- In the event that several falsework plans are submitted simultaneously, or an additional plan is submitted for review before the review of a previously submitted plan has been completed, the Contractor shall designate the sequence in which the plans are to be reviewed. In such event, the time to be provided for the review of any plan in the sequence shall be not less than the review time specified above for that plan, plus 2 weeks for each plan of higher priority which is still under review. A falsework plan submittal shall consist of plans for a single bridge or portion thereof. For multi-frame bridges, each frame shall require a separate falsework plan submittal.

Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended by adding the following paragraphs:

- If structural composite lumber is proposed for use, the falsework drawings shall clearly identify the structural composite lumber members by grade (E value), species, and type. The Contractor shall provide technical data from the manufacturer showing the tabulated working stress values of the composite lumber. The Contractor shall furnish a certificate of compliance as specified in Section 6-1.07, "Certificates of Compliance," for each delivery of structural composite lumber to the project site.
- For falsework piles with a calculated loading capacity greater than 900 kN, the falsework piles shall be designed by an engineer who is registered as either a Civil Engineer or a Geotechnical Engineer in the State of California, and the calculations shall be submitted to the Engineer.

The first paragraph in Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

- The design load for falsework shall consist of the sum of dead and live vertical loads, and an assumed horizontal load. The minimum total design load for any falsework, including members that support walkways, shall be not less than 4800 N/m² for the combined live and dead load regardless of slab thickness.

The eighth paragraph in Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

- In addition to the minimum requirements specified in this Section 51-1.06A, falsework for box girder structures with internal falsework bracing systems using flexible members capable of withstanding tensile forces only, shall be designed to include the vertical effects caused by the elongation of the flexible member and the design horizontal load combined with the dead and live loads imposed by concrete placement for the girder stems and connected bottom slabs. Falsework comprised of individual steel towers with bracing systems using flexible members capable of withstanding tensile forces only to resist overturning, shall be exempt from these additional requirements.

The third paragraph in Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended to read:

- When falsework is supported on piles, the piles shall be driven and the actual nominal resistance assessed in conformance with the provisions in Section 49, "Piling."

Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended by adding the following paragraphs:

- For falsework piles with a calculated nominal resistance greater than 1800 kN, the Contractor shall conduct dynamic monitoring of pile driving and generate field acceptance criteria based on a wave equation analysis. These analyses shall be signed by an engineer who is registered as a Civil Engineer in the State of California and submitted to the Engineer prior to completion of falsework erection.

- Prior to the placement of falsework members above the stringers, the final bracing system for the falsework shall be installed.

Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended by adding the following paragraph:

- The falsework removal operation shall be conducted in such a manner that any portion of the falsework not yet removed remains in a stable condition at all times.

The sixth paragraph in Section 51-1.09, "Placing Concrete," of the Standard Specifications is amended to read:

- Vibrators used to consolidate concrete containing epoxy-coated bar reinforcement or epoxy-coated prestressing steel shall have a resilient covering to prevent damage to the epoxy-coating on the reinforcement or prestressing steel.

The table in the ninth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearing Pads," of the Standard Specifications is amended to read:

Tensile strength, percent	-15
Elongation at break, percent	-40; but not less than 300% total elongation of the material
Hardness, points	+10

The first sentence of the fourth paragraph in Section 51-1.17, "Finish Bridge Decks," of the Standard Specifications is amended to read:

- The smoothness of completed roadway surfaces of structures, approach slabs and the adjacent 15 m of approach pavement, and the top surfaces of concrete decks which are to be covered with another material, will be tested by the Engineer with a bridge profilograph in conformance with the requirements in California Test 547 and the requirements herein.

Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications is amended by deleting the seventh, thirteenth and fourteenth paragraphs.

The fourteenth paragraph in Section 51-1.23, "Payment," of the Standard Specifications is amended by deleting "and injecting epoxy in cracks".

SECTION 52: REINFORCEMENT

Issue Date: December 31, 2001

The third paragraph in Section 52-1.04, "Inspection," of the Standard Specifications is amended to read:

- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall also be furnished for each shipment of epoxy-coated bar reinforcement or wire reinforcement certifying that the coated reinforcement conforms to the requirements in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and the

provisions in Section 52-1.02B, "Epoxy-coated Reinforcement." The Certificate of Compliance shall include all of the certifications specified in ASTM Designation: A 775/A 775M or A 884/A 884M respectively, and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

The third paragraph in Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The total slip of the reinforcing bars within the splice sleeve after loading in tension to 200 MPa and relaxing to 20 MPa shall not exceed the values listed in the following table. The slip shall be measured between gage points that are clear of the splice sleeve.

Reinforcing Bar Number	Total Slip (µm)
13	250
16	250
19	250
22	350
25	350
29	350
32	450
36	450
43	600
57	750

The first paragraph in Section 52-1.08C(5), "Sleeve-Lockshear Bolt Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, center hole with centering pin, and bolts that are tightened until the bolt heads shear off with the bolt ends left embedded in the reinforcing bars. The seamless steel sleeve shall be either formed into a V configuration or shall have 2 serrated steel strips welded to the inside of the sleeve.

Section 52-1.08F, "Nondestructive Splice Tests," of the Standard Specifications is amended by deleting the seventh paragraph.

SECTION 55: STEEL STRUCTURES

Issue Date: December 31, 2001

Section 55-3.14, "Bolted Connections," of the Standard Specifications is amended by adding the following after the ninth paragraph:

- If a torque multiplier is used in conjunction with a calibrated wrench as a method for tightening fastener assemblies to the required tension, both the multiplier and the wrench shall be calibrated together as a system. The same length input and output sockets and extensions that will be used in the work shall also be included in the calibration of the system. The manufacturer's torque multiplication ratio shall be adjusted during calibration of the system, such that when this adjusted ratio is multiplied by the actual input calibrated wrench reading, the product is a calculated output torque that is within 2 percent of the true output torque. When this system is used in the work to perform any installation tension testing, rotational capacity testing, fastener tightening, or tension verification, it shall be used, intact as calibrated.

The sixth paragraph of Section 55-4.02, "Payment," of the Standard Specifications is amended to read:

- If a portion or all of the structural steel is fabricated more than 480 air line kilometers from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impracticable and extremely difficult to ascertain and determine the actual increase in these expenses, it is agreed that payment to the Contractor for furnishing the structural steel from each fabrication site located more than 480 air line kilometers from both Sacramento and Los Angeles will be reduced \$5000 or by an amount computed at \$0.044 per kilogram of structural steel

fabricated, whichever is greater, or in the case of each fabrication site located more than 4800 air line kilometers from both Sacramento and Los Angeles, payment will be reduced \$8000 or by \$0.079 per kilogram of structural steel fabricated, whichever is greater.

SECTION 56: SIGNS

Issue Date: December 31, 2001

Section 56-1.01, "Description," of the Standard Specifications is amended by deleting the third paragraph.

The sixth through the thirteenth paragraphs in Section 56-1.03, "Fabrication," of the Standard Specifications are amended to read:

- High-strength bolted connections, where shown on the plans, shall conform to the provisions in Section 55-3.14, "Bolted Connections," except that only fastener assemblies consisting of a high-strength bolt, nut, hardened washer, and direct tension indicator shall be used.
- High-strength fastener assemblies, and any other bolts, nuts, and washers attached to sign structures shall be zinc-coated by the mechanical deposition process.
- An alternating snugging and tensioning pattern for anchor bolts and high-strength bolted splices shall be used. Once tensioned, high-strength fastener components and direct tension indicators shall not be reused.
- For bolt diameters less than 10 mm, the diameter of the bolt hole shall be not more than 0.80-mm larger than the nominal bolt diameter. For bolt diameters greater than or equal to 10 mm, the diameter of the bolt hole shall be not more than 1.6 mm larger than the nominal bolt diameter.
- Sign structures shall be fabricated into the largest practical sections prior to galvanizing.
- Ribbed sheet metal panels for box beam closed truss sign structures shall be fastened to the truss members by cap screws or bolts as shown on the plans, or by 4.76 mm stainless steel blind rivets conforming to Industrial Fasteners Institute, Standard IFI-114, Grade 51. The outside diameter of the large flange rivet head shall be not less than 15.88 mm in diameter. Web splices in ribbed sheet metal panels may be made with similar type blind rivets of a size suitable for the thickness of material being connected.
- Spalling or chipping of concrete structures shall be repaired by the Contractor at the Contractor's expense.
- Overhead sign supports shall have an aluminum identification plate permanently attached near the base, adjacent to the traffic side on one of the vertical posts, using either stainless steel rivets or stainless steel screws. As a minimum, the information on the plate shall include the name of the manufacturer, the date of manufacture and the contract number.

SECTION 59: PAINTING

Issue Date: December 31, 2001

Section 59-2.01, "General," of the Standard Specifications is amended by adding the following paragraphs after the first paragraph:

- Unless otherwise specified, no painting Contractors or subcontractors will be permitted to commence work without having the following current "SSPC: The Society for Protective Coatings" (formerly the Steel Structures Painting Council) certifications in good standing:
 - A. For cleaning and painting structural steel in the field, certification in conformance with the requirements in Qualification Procedure No. 1, "Standard Procedure For Evaluating Painting Contractors (Field Application to Complex Industrial Structures)" (SSPC-QP 1).
 - B. For removing paint from structural steel, certification in conformance with the requirements in Qualification Procedure No. 2, "Standard Procedure For Evaluating Painting Contractors (Field Removal of Hazardous Coatings from Complex Structures)" (SSPC-QP 2).
 - C. For cleaning and painting structural steel in a permanent painting facility, certification in conformance with the requirements in Qualification Procedure No. 3, "Standard Procedure For Evaluating Qualifications of Shop Painting Applicators" (SSPC-QP 3). The AISC's Sophisticated Paint Endorsement (SPE) quality program will be considered equivalent to SSPC-QP 3.

The third paragraph of Section 59-2.03, "Blast Cleaning," of the Standard Specifications is amended to read:

- Exposed steel or other metal surfaces to be blast cleaned shall be cleaned in conformance with the requirements in Surface Preparation Specification No. 6, "Commercial Blast Cleaning," of the "SSPC: The Society for Protective Coatings." Blast cleaning shall leave all surfaces with a dense, uniform, angular anchor pattern of not less than 35 μm as measured in conformance with the requirements in ASTM Designation: D 4417.

The first paragraph of Section 59-2.06, "Hand Cleaning," of the Standard Specifications is amended to read:

- Dirt, loose rust and mill scale, or paint which is not firmly bonded to the surfaces shall be removed in conformance with the requirements in Surface Preparation Specification No. 2, "Hand Tool Cleaning," of the "SSPC: The Society for Protective Coatings." Edges of old remaining paint shall be feathered.

The fourth paragraph of Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

- The dry film thickness of the paint will be measured in place with a calibrated Type 2 magnetic film thickness gage in conformance with the requirements of specification SSPC-PA2 of the "SSPC: The Society for Protective Coatings."

SECTION 75: MISCELLANEOUS METAL

Issue Date: December 31, 2001

The table in the tenth paragraph of Section 75-1.02, "Miscellaneous Iron and Steel," of the Standard Specifications is amended to read:

Material	Specification
Steel bars, plates and shapes	ASTM Designation: A 36/A 36M or A 575, A 576 (AISI or M Grades 1016 through 1030 except Grade 1017)
Steel fastener components for general applications:	
Bolts and studs	ASTM Designation: A 307
Headed anchor bolts	ASTM Designation: A 307, Grade B, including S1 supplementary requirements
Nonheaded anchor bolts	ASTM Designation: A 307, Grade C, including S1 supplementary requirements and S1.6 of AASHTO Designation: M 314 supplementary requirements or AASHTO Designation: M 314, Grade 36 or 55, including S1 supplementary requirements
High-strength bolts and studs, threaded rods, and nonheaded anchor bolts	ASTM Designation: A 449, Type 1
Nuts	ASTM Designation: A 563, including Appendix X1*
Washers	ASTM Designation: F 844
Components of high-strength steel fastener assemblies for use in structural steel joints:	
Bolts	ASTM Designation: A 325, Type 1
Tension control bolts	ASTM Designation: F 1852, Type 1
Nuts	ASTM Designation: A 563, including Appendix X1*
Hardened washers	ASTM Designation: F 436, Type 1, Circular, including S1 supplementary requirements
Direct tension indicators	ASTM Designation: F 959, Type 325, zinc-coated
Stainless steel fasteners (Alloys 304 & 316) for general applications:	
Bolts, screws, studs, threaded rods, and nonheaded anchor bolts	ASTM Designation: F 593 or F 738M
Nuts	ASTM Designation: F 594 or F 836M
Washers	ASTM Designation: A 240/A 240M and ANSI B 18.22M
Carbon-steel castings	ASTM Designation: A 27/A 27M, Grade 65-35 [450-240], Class 1
Malleable iron castings	ASTM Designation: A 47, Grade 32510 or A 47M, Grade 22010
Gray iron castings	ASTM Designation: A 48, Class 30B
Ductile iron castings	ASTM Designation: A 536, Grade 65-45-12
Cast iron pipe	Commercial quality
Steel pipe	Commercial quality, welded or extruded
Other parts for general applications	Commercial quality

* Zinc-coated nuts that will be tightened beyond snug or wrench tight shall be furnished with a dyed dry lubricant conforming to Supplementary Requirement S2 in ASTM Designation: A 563.

The table in the eighteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Stud Diameter (millimeters)	Sustained Tension Test Load (kilonewtons)
29.01-33.00	137.9
23.01-29.00	79.6
21.01-23.00	64.1
* 18.01-21.00	22.2
15.01-18.00	18.2
12.01-15.00	14.2
9.01-12.00	9.34
6.00-9.00	4.23

* Maximum stud diameter permitted for mechanical expansion anchors.

The table in the nineteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Stud Diameter (millimeters)	Ultimate Tensile Load (kilonewtons)
30.01-33.00	112.1
27.01-30.00	88.1
23.01-27.00	71.2
20.01-23.00	51.6
16.01-20.00	32.0
14.01-16.00	29.4
12.00-14.00	18.7

The table in the twenty-second paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Installation Torque Values, (newton meters)

Stud Diameter (millimeters)	Shell Type Mechanical Expansion Anchors	Integral Stud Type Mechanical Expansion Anchors	Resin Capsule Anchors and Cast-in-Place Inserts
29.01-33.00	—	—	540
23.01-29.00	—	—	315
21.01-23.00	—	—	235
18.01-21.00	110	235	200
15.01-18.00	45	120	100
12.01-15.00	30	65	40
9.01-12.00	15	35	24
6.00-9.00	5	10	—

SECTION 83: RAILINGS AND BARRIERS

Issue Date: June 13, 2002

The ninth paragraph in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications is amended to read:

- The grades and species of wood posts and blocks shall be No. 1 timbers (also known as No. 1 structural) Douglas fir or No. 1 timbers Southern yellow pine. Wood posts and blocks shall be graded in conformance with the provisions in Section 57-2, "Structural Timber," of the Standard Specifications, except allowances for shrinkage after mill cutting shall in no case exceed 5 percent of the American Lumber Standards minimum sizes, at the time of installation.

The eleventh paragraph in Section 83-1.02B, "Metal Beam Guard Railing," of the Standard Specifications is amended to read:

- Wood posts and blocks shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 Kg/m³, and need not be incised.

SECTION 85: PAVEMENT MARKERS

Issue Date: May 16, 2003

The second through fifth paragraphs in Section 85-1.03, "Sampling, Tolerances and Packaging," of the Standard Specifications are amended to read:

Sampling

- Twenty markers selected at random will constitute a representative sample for each lot of markers.
- The lot size shall not exceed 25000 markers.

Tolerances

- Three test specimens will be randomly selected from the sample for each test and tested in conformance with these specifications. Should any one of the 3 specimens fail to conform with the requirements in these specifications, 6 additional specimens will be tested. The failure of any one of these 6 specimens shall be cause for rejection of the entire lot or shipment represented by the sample.
- The entire sample of retroreflective pavement markers will be tested for reflectance. The failure of 10 percent or more of the original sampling shall be cause for rejection.

Section 85-1.04, "Non-Reflective Pavement Markers," of the Standard Specifications is amended to read:

85-1.04 Non-Reflective Pavement Markers

- Non-reflective pavement markers (Types A and AY) shall be, at the option of the Contractor, either ceramic or plastic conforming to these specifications.
- The top surface of the marker shall be convex with a gradual change in curvature. The top, bottom and sides shall be free of objectionable marks or discoloration that will affect adhesion or appearance.
- The bottom of markers shall have areas of integrally formed protrusions or indentations, which will increase the effective bonding surface area of adhesive. The bottom surface of the marker shall not deviate more than 1.5 mm from a flat surface. The areas of protrusion shall have faces parallel to the bottom of the marker and shall project approximately one mm from the bottom.

The second through fourth paragraphs of Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," of the Standard Specifications are deleted.

The table in the fifth paragraph in Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," of the Standard Specifications is amended to read:

Testing

- Tests shall be performed in conformance with the requirements in California Test 669.

Test	Test Description	Requirement
a	Bond strength	4.8 MPa, min.
b	Glaze thickness	180 µm, min.
c	Hardness	6 Moh, min.
d	Luminance factor, Type A, white markers only, glazed surface	75, min.
e	Yellowness index, Type A, white markers only, glazed surface	7, max.
f	Color-yellow, Type AY, yellow markers only. The chromaticity coordinates shall be within a color box defined in CTM 669	Pass
g	Compressive strength	6700 N, min.
h	Water absorption	2.0 %, max.
i	Artificial weathering, 500 hours exposure, yellowness index	20, max.

Section 85-1.04B, "Non-Reflective Pavement Markers (Plastic)," of the Standard Specifications is amended to read:

85-1.04B Non-Reflective Pavement Markers (Plastic)

- Plastic non-reflective pavement markers Types A and AY shall be, at the option of the Contractor, either polypropylene or acrylonitrile-butadiene-styrene (ABS) plastic type.
- Plastic markers shall conform to the testing requirements specified in Section 85-1.04A, "Non-Reflective Pavement Markers (Ceramic)," except that Tests a, b, c, and h shall not apply. The plastic markers shall not be coated with substances that interfere with the ability of the adhesive bonding to the marker.

The sixth and seventh paragraphs in Section 85-1.05, "Retroreflective Pavement Markers," of the Standard Specifications are amended to read:

Testing

- Tests shall be performed in conformance with the requirements in California Test 669.

Test Description	Requirement		
Bond strength ^a	3.4 MPa, min.		
Compressive strength ^b	8900 N, min.		
Abrasion resistance, marker must meet the respective specific intensity minimum requirements after abrasion.	Pass		
Water Soak Resistance	No delamination of the body or lens system of the marker nor loss of reflectance		
Reflectance	Specific Intensity		
	Clear	Yellow	Red
0° Incidence Angle, min.	3.0	1.5	0.75
20° Incidence Angle, min.	1.2	0.60	0.30
After one year field evaluation	0.30	0.15	0.08
<p>a Failure of the marker body or filler material prior to reaching 3.4 MPa shall constitute a failing bond strength test.</p> <p>b Deformation of the marker of more than 3 mm at a load of less than 8900 N or delamination of the shell and the filler material of more than 3 mm regardless of the load required to break the marker shall be cause for rejection of the markers as specified in Section 85-1.03, "Sampling, Tolerances and Packaging."</p>			

- Pavement markers to be placed in pavement recesses shall conform to the above requirements for retroreflective pavement markers except that the minimum compressive strength requirement shall be 5338 N.

The eighth paragraph of Section 85-1.05, "Retroreflective Pavement Markers" of the Standard Specifications is deleted. The eighth paragraph in Section 85-1.06, "Replacement," of the Standard Specifications is amended to read:

- Epoxy adhesive shall not be used to apply non-reflective plastic pavement markers.

SECTION 86: SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

Issue Date: February 28, 2002

The seventh paragraph of Section 86-2.03, "Foundations," of the Standard Specifications is amended to read:

- Forms shall be true to line and grade. Tops of foundations for posts and standards, except special foundations, shall be finished to curb or sidewalk grade or as directed by the Engineer. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position and to proper height, and anchor bolts shall be held in place by means of rigid templates. Anchor bolts shall not be installed more than 1:40 from vertical.

The twelfth paragraph of Section 86-2.03, "Foundations," of the Standard Specifications is amended to read:

- Plumbing of the standards shall be accomplished by adjusting the leveling nuts before placing the mortar or before the foundation is finished to final grade. Shims, or other similar devices shall not be used for plumbing or raking of posts, standards or pedestals. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made, firm contact shall exist between all bearing surfaces of the anchor bolt nuts, washers, and the base plate.

Section 86-8.01, "Payment," of the Standard Specifications is amended to read by adding the following paragraph after the first paragraph:

- If a portion or all of the traffic signal and lighting standards, pursuant to Standard Specification Section 86, "Signals, Lighting and Electrical Systems," are fabricated more than 480 air line kilometers from both-Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impracticable and extremely difficult to ascertain and determine the actual increase in such expenses, it is agreed that payment to the Contractor for furnishing such items from each fabrication site located more than 480 air line kilometers from both Sacramento and Los Angeles will be reduced \$5000; in addition, in the case where a fabrication site is located more than 4800 air line kilometers from both Sacramento and Los Angeles, payment will be reduced an additional \$3000 per each fabrication site (\$8000 total per site).

SECTION 88: ENGINEERING FABRIC

Issue Date: January 15, 2002

Section 88-1.02, "Pavement Reinforcing Fabric," of the Standard Specifications is amended to read:

- Pavement reinforcing fabric shall be 100 percent polypropylene staple fiber fabric material, needle-punched, thermally bonded on one side, and conform to the following:

Specification	Requirement
Weight, grams per square meter ASTM Designation: D 5261	140
Grab tensile strength (25-mm grip), kilonewtons, min. in each direction ASTM Designation: D 4632	0.45
Elongation at break, percent min. ASTM Designation: D 4632	50
Asphalt retention by fabric, grams per square meter. (Residual Minimum) ASTM Designation: D 6140	900

Note: Weight, grab, elongation and asphalt retention are based on Minimum Average Roll Value (MARV)

SECTION 90: PORTLAND CEMENT CONCRETE

Issue Date: March 12, 2002

Section 90, "Portland Cement Concrete," of the Standard Specifications is amended to read:

**SECTION 90: PORTLAND CEMENT CONCRETE
90-1 GENERAL**

90-1.01 DESCRIPTION

- Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.
- The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete. Concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.
- Unless otherwise specified, cementitious material shall be a combination of cement and mineral admixture. Cementitious material shall be either:
 1. "Type IP (MS) Modified" cement; or
 2. A combination of "Type II Modified" portland cement and mineral admixture; or
 3. A combination of Type V portland cement and mineral admixture.
- Type III portland cement shall be used only as allowed in the special provisions or with the approval of the Engineer.
 - Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.
 - Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.
 - Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.
 - Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.
 - Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.
 - Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic meter of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content (kg/m ³)
Concrete designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min., 475 max.
Roof sections of exposed top box culverts	400 min., 475 max.
Other portions of structures	350 min., 475 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min.
Roof sections of exposed top box culverts	400 min.
Prestressed members	400 min.
Seal courses	400 min.
Other portions of structures	350 min.
Concrete for precast members	350 min., 550 max.

- Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be designated by compressive strength. If the plans show a 28-day compressive strength that is 28 MPa or greater, an additional 14 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans that are 25 MPa or less are shown for design information only and are not a requirement for acceptance of the concrete.
- Concrete designated by compressive strength shall be proportioned such that the concrete will attain the strength shown on the plans or specified in the special provisions.
- Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

- Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.
- If any concrete has a cementitious material, portland cement, or mineral admixture content that is less than the minimum required, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.55 for each kilogram of cementitious material, portland cement, or mineral admixture that is less than the minimum required. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions will be made based on the results of California Test 518.
- The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.

90-2 MATERIALS

90-2.01 CEMENT

- Unless otherwise specified, cement shall be either "Type IP (MS) Modified" cement, "Type II Modified" portland cement or Type V portland cement.
- "Type IP (MS) Modified" cement shall conform to the requirements for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate and uniform blend of Type II cement and not more than 35 percent by mass of mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."
- "Type II Modified" portland cement shall conform to the requirements for Type II portland cement in ASTM Designation: C 150.
- In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:
 - A. The cement shall not contain more than 0.60 percent by mass of alkalis, calculated as the percentage of Na₂O plus 0.658 times the percentage of K₂O, when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in conformance with the requirements in ASTM Designation: C 114;
 - B. The autoclave expansion shall not exceed 0.50 percent; and
 - C. Mortar, containing the cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent, except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members, or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.
- Type III and Type V portland cements shall conform to the requirements in ASTM Designation: C 150 and the additional requirements listed above for "Type II Modified" portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.
 - Cement used in the manufacture of cast-in-place concrete for exposed surfaces of like elements of a structure shall be from the same cement mill.
 - Cement shall be protected from exposure to moisture until used. Sacked cement shall be piled to permit access for tally, inspection, and identification of each shipment.
 - Adequate facilities shall be provided to assure that cement meeting the provisions specified in this Section 90-2.01 shall be kept separate from other cement in order to prevent any but the specified cement from entering the work. Safe and suitable facilities for sampling cement shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper, in conformance with California Test 125.
 - If cement is used prior to sampling and testing as provided in Section 6-1.07, "Certificates of Compliance," and the cement is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the cement manufacturer or supplier of the cement. If the cement is used in ready-mixed concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.
 - Cement furnished without a Certificate of Compliance shall not be used in the work until the Engineer has had sufficient time to make appropriate tests and has approved the cement for use.

90-2.02 AGGREGATES

- Aggregates shall be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.
- Natural aggregates shall be thoroughly and uniformly washed before use.
- The Contractor, at the Contractor's expense, shall provide safe and suitable facilities, including necessary splitting devices for obtaining samples of aggregates, in conformance with California Test 125.
- Aggregates shall be of such character that it will be possible to produce workable concrete within the limits of water content provided in Section 90-6.06, "Amount of Water and Penetration."
- Aggregates shall have not more than 10 percent loss when tested for soundness in conformance with the requirements in California Test 214. The soundness requirement for fine aggregate will be waived, provided that the durability index, D_f , of the fine aggregate is 60, or greater, when tested for durability in conformance with California Test 229.
- If the results of any one or more of the Cleanness Value, Sand Equivalent, or aggregate grading tests do not meet the requirements specified for "Operating Range" but all meet the "Contract Compliance" requirements, the placement of concrete shall be suspended at the completion of the current pour until tests or other information indicate that the next material to be used in the work will comply with the requirements specified for "Operating Range."
- If the results of either or both the Cleanness Value and coarse aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete that is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State \$4.60 per cubic meter for paving concrete and \$7.20 per cubic meter for all other concrete for the concrete represented by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.
- If the results of either or both the Sand Equivalent and fine aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete which is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State \$4.60 per cubic meter for paving concrete and \$7.20 per cubic meter for all other concrete for the concrete represented by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.
- The 2 preceding paragraphs apply individually to the "Contract Compliance" requirements for coarse aggregate and fine aggregate. When both coarse aggregate and fine aggregate do not conform to the "Contract Compliance" requirements, both paragraphs shall apply. The payments specified in those paragraphs shall be in addition to any payments made in conformance with the provisions in Section 90-1.01, "Description."
- No single Cleanness Value, Sand Equivalent or aggregate grading test shall represent more than 250 m³ of concrete or one day's pour, whichever is smaller.
- Aggregates specified for freeze-thaw resistance shall pass the freezing and thawing test, California Test 528.
- The Contractor shall notify the Engineer of the proposed source of freeze-thaw resistant concrete aggregates at least 4 months before intended use. Should the Contractor later propose a different source of concrete aggregates, the Contractor shall again notify the Engineer at least 4 months before intended use. Blending of fine or coarse aggregates from untested sources with acceptable aggregates will not be permitted. Provisions for the time of submission of samples as provided in Section 40-1.015, "Cement Content," are superseded by the foregoing.
- Concurrently with notification of proposed sources of freeze-thaw resistant concrete aggregates, the Contractor shall furnish samples in the quantity ordered by the Engineer. The samples shall be secured under the direct supervision of the Engineer. Samples from existing stockpiles of processed aggregate shall be taken from washed materials and shall be visibly damp. Samples from materials in place in a material source shall be taken at depths from the existing surface that will ensure the presence of the full quantity of ground water. Excavations for the purpose of securing samples shall be made to the full depth of intended source operations. Samples shall be protected against loss of contained water until they are delivered to the Engineer.
- The Engineer will waive the above freeze-thaw test and the 4-month advance notice, required in this Section, provided aggregates are to be obtained from sources that have previously passed this test and test results are currently applicable.
- No extension of contract time will be allowed for the time required to perform the freezing and thawing test.
- When the source of an aggregate is changed, except for pavement concrete, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using the aggregates. When the source of an aggregate is changed for pavement concrete, the Engineer shall be allowed sufficient time to adjust the mix, and the aggregates shall not be used until necessary adjustments are made.

90-2.02A Coarse Aggregate

- Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, crushed air-cooled iron blast furnace slag or combinations thereof. Crushed air-cooled blast furnace slag shall not be used in reinforced or prestressed concrete.
- Coarse aggregate shall conform to the following quality requirements:

Tests	California Test	Requirements
Loss in Los Angeles Rattler (after 500 revolutions)	211	45% max.
Cleanness Value		
Operating Range	227	75 min.
Contract Compliance	227	71 min.

• In lieu of the above Cleanness Value requirements, a Cleanness Value "Operating Range" limit of 71, minimum, and a Cleanness Value "Contract Compliance" limit of 68, minimum, will be used to determine the acceptability of the coarse aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. coarse aggregate sampled at the completion of processing at the aggregate production plant had a Cleanness Value of not less than 82 when tested by California Test 227; and
2. prequalification tests performed in conformance with the requirements in California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.02B Fine Aggregate

• Fine aggregate shall consist of natural sand, manufactured sand produced from larger aggregate or a combination thereof. Manufactured sand shall be well graded.

- Fine aggregate shall conform to the following quality requirements:

Test	California Test	Requirements
Organic Impurities	213	Satisfactory ^a
Mortar Strengths Relative to Ottawa Sand	515	95%, min.
Sand Equivalent:		
Operating Range	217	75, min.
Contract Compliance	217	71, min.

a Fine aggregate developing a color darker than the reference standard color solution may be accepted if it is determined by the Engineer, from mortar strength tests, that a darker color is acceptable.

• In lieu of the above Sand Equivalent requirements, a Sand Equivalent "Operating Range" limit of 71 minimum and a Sand Equivalent "Contract Compliance" limit of 68 minimum will be used to determine the acceptability of the fine aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. fine aggregate sampled at the completion of processing at the aggregate production plant had a Sand Equivalent value of not less than 82 when tested by California Test 217; and
2. prequalification tests performed in conformance with California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.03 WATER

• In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1300 parts per million of sulfates as SO₄, when tested in conformance with California

Test 417. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1300 parts per million of sulfates as SO₄, when tested in conformance with California Test 417. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with the requirements in ASTM Designation: C 191 or ASTM Designation: C 266 or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with the requirements in ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with the requirements in ASTM Designation: C 109.

- In non-reinforced concrete work, the water for curing, for washing aggregates and for mixing shall be free from oil and shall not contain more than 2000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, or more than 1500 parts per million of sulfates as SO₄, when tested in conformance with California Test 417.

- In addition to the above provisions, water for curing concrete shall not contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

- Water reclaimed from mixer wash-out operations may be used in mixing concrete. The water shall not contain coloring agents or more than 300 parts per million of alkalis (Na₂O + 0.658 K₂O) as determined on the filtrate. The specific gravity of the water shall not exceed 1.03 and shall not vary more than ±0.010 during a day's operations.

90-2.04 ADMIXTURE MATERIALS

- Admixture materials shall conform to the requirements in the following ASTM Designations:

A. Chemical Admixtures—ASTM Designation: C 494.

B. Air-entraining Admixtures—ASTM Designation: C 260.

C. Calcium Chloride—ASTM Designation: D 98.

D. Mineral Admixtures—Coal fly ash; raw or calcined natural pozzolan as specified in ASTM Designation: C618; silica fume conforming to the requirements in ASTM Designation: C1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

- Unless otherwise specified in the special provisions, mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

90-3 AGGREGATE GRADINGS

90-3.01 GENERAL

- Before beginning concrete work, the Contractor shall submit in writing to the Engineer the gradation of the primary aggregate nominal sizes that the Contractor proposes to furnish. If a primary coarse aggregate or the fine aggregate is separated into 2 or more sizes, the proposed gradation shall consist of the gradation for each individual size, and the proposed proportions of each individual size, combined mathematically to indicate one proposed gradation. The proposed gradation shall meet the grading requirements shown in the table in this section, and shall show the percentage passing each of the sieve sizes used in determining the end result.

- The Engineer may waive, in writing, the gradation requirements in this Section 90-3.01 and in Sections 90-3.02, "Coarse Aggregate Grading," 90-3.03, "Fine Aggregate Grading," and 90-3.04, "Combined Aggregate Gradings," if, in the Engineer's opinion, furnishing the gradation is not necessary for the type or amount of concrete work to be constructed.

- Gradations proposed by the Contractor shall be within the following percentage passing limits:

Primary Aggregate Nominal Size	Sieve Size	Limits of Proposed Gradation
37.5-mm x 19-mm	25-mm	19 - 41
25-mm x 4.75-mm	19-mm	52 - 85
25-mm x 4.75-mm	9.5-mm	15 - 38
12.5-mm x 4.75-mm	9.5-mm	40 - 78
9.5-mm x 2.36-mm	9.5-mm	50 - 85
Fine Aggregate	1.18-mm	55 - 75
Fine Aggregate	600-µm	34 - 46
Fine Aggregate	300-µm	16 - 29

- Should the Contractor change the source of supply, the Contractor shall submit in writing to the Engineer the new gradations before their intended use.

90-3.02 COARSE AGGREGATE GRADING

- The grading requirements for coarse aggregates are shown in the following table for each size of coarse aggregate:

Sieve Sizes	Percentage Passing Primary Aggregate Nominal Sizes							
	37.5-mm x 19-mm		25-mm x 4.75-mm		12.5-mm x 4.75-mm		9.5-mm x 2.36-mm	
	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance	Operating Range	Contract Compliance
50-mm	100	100	—	—	—	—	—	—
37.5-mm	88-100	85-100	100	100	—	—	—	—
25-mm	x ± 18	X ± 25	88-100	86-100	—	—	—	—
19-mm	0-17	0-20	X ± 15	X ± 22	100	100	—	—
12.5-mm	—	—	—	—	82-100	80-100	100	100
9.5-mm	0-7	0-9	X ± 15	X ± 22	X ± 15	X ± 22	X ± 15	X ± 20
4.75-mm	—	—	0-16	0-18	0-15	0-18	0-25	0-28
2.36-mm	—	—	0-6	0-7	0-6	0-7	0-6	0-7

- In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."

Coarse aggregate for the 37.5-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," shall be furnished in 2 or more primary aggregate nominal sizes. Each primary aggregate nominal size may be separated into 2 sizes and stored separately, provided that the combined material conforms to the grading requirements for that particular primary aggregate nominal size.

- When the 25-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," is to be used, the coarse aggregate may be separated into 2 sizes and stored separately, provided that the combined material shall conform to the grading requirements for the 25-mm x 4.75-mm primary aggregate nominal size.

90-3.03 FINE AGGREGATE GRADING

- Fine aggregate shall be graded within the following limits:

Sieve Sizes	Percentage Passing	
	Operating Range	Contract Compliance
9.5-mm	100	100
4.75-mm	95-100	93-100
2.36-mm	65-95	61-99
1.18-mm	X ± 10	X ± 13
600-µm	X ± 9	X ± 12
300-µm	X ± 6	X ± 9
150-µm	2-12	1-15
75-µm	0-8	0-10

- In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."

In addition to the above required grading analysis, the distribution of the fine aggregate sizes shall be such that the difference between the total percentage passing the 1.18-mm sieve and the total percentage passing the 600-µm sieve shall be between 10 and 40, and the difference between the percentage passing the 600-µm and 300-µm sieves shall be between 10 and 40.

- Fine aggregate may be separated into 2 or more sizes and stored separately, provided that the combined material conforms to the grading requirements specified in this Section 90-3.03.

90-3.04 COMBINED AGGREGATE GRADINGS

- Combined aggregate grading limits shall be used only for the design of concrete mixes. Concrete mixes shall be designed so that aggregates are combined in proportions that shall produce a mixture within the grading limits for combined

aggregates as specified herein. Within these limitations, the relative proportions shall be as ordered by the Engineer, except as otherwise provided in Section 90-1.01, "Description."

- The combined aggregate grading used in portland cement concrete pavement shall be the 37.5-mm, maximum grading.
- The combined aggregate grading used in concrete for structures and other concrete items, except when specified otherwise in these specifications or the special provisions, shall be either the 37.5-mm, maximum grading, or the 25-mm, maximum grading, at the option of the Contractor.

Grading Limits of Combined Aggregates

Sieve Sizes	Percentage Passing			
	37.5-mm Max.	25-mm Max.	12.5-mm Max.	9.5-mm Max.
50-mm	100	—	—	—
37.5-mm	90-100	100	—	—
25-mm	50-86	90-100	—	—
19-mm	45-75	55-100	100	—
12.5-mm	—	—	90-100	100
9.5-mm	38-55	45-75	55-86	50 - 100
4.75-mm	30-45	35-60	45-63	45 - 63
2.36-mm	23-38	27-45	35-49	35 - 49
1.18-mm	17-33	20-35	25-37	25 - 37
600-µm	10-22	12-25	15-25	15 - 25
300-µm	4-10	5-15	5-15	5 - 15
150-µm	1-6	1-8	1-8	1 - 8
75-µm	0-3	0-4	0-4	0 - 4

- Changes from one grading to another shall not be made during the progress of the work unless permitted by the Engineer.

90-4 ADMIXTURES

90-4.01 GENERAL

- Admixtures used in portland cement concrete shall conform to and be used in conformance with the provisions in this Section 90-4 and the special provisions. Admixtures shall be used when specified or ordered by the Engineer and may be used at the Contractor's option as provided herein.
- Chemical admixtures and air-entraining admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined by California Test 415, shall not be used in prestressed or reinforced concrete.
- Calcium chloride shall not be used in concrete containing steel reinforcement or other embedded metals.
- Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.
- Admixtures shall be uniform in properties throughout their use in the work. Should it be found that an admixture as furnished is not uniform in properties, its use shall be discontinued.
- If more than one admixture is used, the admixtures shall be compatible with each other so that the desirable effects of all admixtures used will be realized.

90-4.02 MATERIALS

- Admixture materials shall conform to the provisions in Section 90-2.04, "Admixture Materials."

90-4.03 ADMIXTURE APPROVAL

- No admixture brand shall be used in the work unless it is on the Department's current list of approved brands for the type of admixture involved.
- Admixture brands will be considered for addition to the approved list if the manufacturer of the admixture submits to the Transportation Laboratory a sample of the admixture accompanied by certified test results demonstrating that the admixture complies with the requirements in the appropriate ASTM Designation and these specifications. The sample shall be sufficient to permit performance of all required tests. Approval of admixture brands will be dependent upon a determination as to compliance with the requirements, based on the certified test results submitted, together with tests the Department may elect to perform.

- When the Contractor proposes to use an admixture of a brand and type on the current list of approved admixture brands, the Contractor shall furnish a Certificate of Compliance from the manufacturer, as provided in Section 6-1.07, "Certificates of Compliance," certifying that the admixture furnished is the same as that previously approved. If a previously approved admixture is not accompanied by a Certificate of Compliance, the admixture shall not be used in the work until the Engineer has had sufficient time to make the appropriate tests and has approved the admixture for use. The Engineer may take samples for testing at any time, whether or not the admixture has been accompanied by a Certificate of Compliance.

- If a mineral admixture is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the manufacturer or supplier of the mineral admixture. If the mineral admixture is used in ready-mix concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.

90-4.04 REQUIRED USE OF CHEMICAL ADMIXTURES AND CALCIUM CHLORIDE

- When the use of a chemical admixture or calcium chloride is specified or ordered by the Engineer, the admixture shall be used at the dosage specified or ordered, except that if no dosage is specified or ordered, the admixture shall be used at the dosage normally recommended by the manufacturer of the admixture.

- Calcium chloride shall be dispensed in liquid, flake, or pellet form. Calcium chloride dispensed in liquid form shall conform to the provisions for dispensing liquid admixtures in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures."

90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES

- The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:

- A. When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass, except that the resultant cementitious material content shall be not less than 300 kilograms per cubic meter; and

- B. When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

- Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements in ASTM Designation: C 494, may be used in portland cement concrete. Inclusion in the mix design submitted for approval will not be required provided that the admixture is added to counteract changing conditions that contribute to delayed setting of the portland cement concrete, and the use or change in dosage of the admixture is approved in writing by the Engineer.

90-4.06 REQUIRED USE OF AIR-ENTRAINING ADMIXTURES

- When air-entrainment is specified or ordered by the Engineer, the air-entraining admixture shall be used in amounts to produce a concrete having the specified air content as determined by California Test 504.

90-4.07 OPTIONAL USE OF AIR-ENTRAINING ADMIXTURES

- When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent, and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

90-4.08 REQUIRED USE OF MINERAL ADMIXTURES

- Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material.

- The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C 618.

- The amounts of cement and mineral admixture used in cementitious material shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

- A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content;
- B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
 1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix;
 2. When the calcium oxide content of a mineral admixture is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix;
 3. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix
- C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

90-4.09 BLANK

90-4.10 PROPORTIONING AND DISPENSING LIQUID ADMIXTURES

- Chemical admixtures and air-entraining admixtures shall be dispensed in liquid form. Dispensers for liquid admixtures shall have sufficient capacity to measure at one time the prescribed quantity required for each batch of concrete. Each dispenser shall include a graduated measuring unit into which liquid admixtures are measured to within ± 5 percent of the prescribed quantity for each batch. Dispensers shall be located and maintained so that the graduations can be accurately read from the point at which proportioning operations are controlled to permit a visual check of batching accuracy prior to discharge. Each measuring unit shall be clearly marked for the type and quantity of admixture.

- Each liquid admixture dispensing system shall be equipped with a sampling device consisting of a valve located in a safe and readily accessible position such that a sample of the admixture may be withdrawn slowly by the Engineer.

- If more than one liquid admixture is used in the concrete mix, each liquid admixture shall have a separate measuring unit and shall be dispensed by injecting equipment located in such a manner that the admixtures are not mixed at high concentrations and do not interfere with the effectiveness of each other. When air-entraining admixtures are used in conjunction with other liquid admixtures, the air-entraining admixture shall be the first to be incorporated into the mix.

- When automatic proportioning devices are required for concrete pavement, dispensers for liquid admixtures shall operate automatically with the batching control equipment. The dispensers shall be equipped with an automatic warning system in good operating condition that will provide a visible or audible signal at the point at which proportioning operations are controlled when the quantity of admixture measured for each batch of concrete varies from the preselected dosage by more than 5 percent, or when the entire contents of the measuring unit are not emptied from the dispenser into each batch of concrete.

- Unless liquid admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow into the stream of water so that the admixtures are well dispersed throughout the batch, except that air-entraining admixtures may be dispensed directly into moist sand in the batching bins provided that adequate control of the air content of the concrete can be maintained.

- Liquid admixtures requiring dosages greater than 2.5 L/m^3 shall be considered to be water when determining the total amount of free water as specified in Section 90-6.06, "Amount of Water and Penetration."

- Special admixtures, such as "high range" water reducers that may contribute to a high rate of slump loss, shall be measured and dispensed as recommended by the admixture manufacturer and as approved by the Engineer.

90-4.11 STORAGE, PROPORTIONING, AND DISPENSING OF MINERAL ADMIXTURES

- Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.

- Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.

- Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.

- When concrete is completely mixed in stationary paving mixers, the mineral admixture shall be weighed in a separate weigh hopper conforming to the provisions for cement weigh hoppers and charging and discharging mechanisms in Section 90-5.03A, "Proportioning for Pavement," and the mineral admixture and cement shall be introduced simultaneously into the mixer proportionately with the aggregate. If the mineral admixture is not weighed in a separate weigh hopper, the Contractor shall provide certification that the stationary mixer is capable of mixing the cement, admixture, aggregates and water uniformly prior to discharge. Certification shall contain the following:

- A. Test results for 2 compressive strength test cylinders of concrete taken within the first one-third and 2 compressive strength test cylinders of concrete taken within the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;"
- B. Calculations demonstrating that the difference in the averages of 2 compressive strengths taken in the first one-third is no greater than 7.5 percent different than the averages of 2 compressive strengths taken in the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;" and
- C. The mixer rotation speed and time of mixing prior to discharge that are required to produce a mix that meets the requirements above.

90-5 PROPORTIONING

90-5.01 STORAGE OF AGGREGATES

- Aggregates shall be stored or stockpiled in such a manner that separation of coarse and fine particles of each size shall be avoided and also that the various sizes shall not become intermixed before proportioning.

- Aggregates shall be stored or stockpiled and handled in a manner that shall prevent contamination by foreign materials. In addition, storage of aggregates at batching or mixing facilities that are erected subsequent to the award of the contract and that furnish concrete to the project shall conform to the following:

- A. Intermingling of the different sizes of aggregates shall be positively prevented. The Contractor shall take the necessary measures to prevent intermingling. The preventive measures may include, but are not necessarily limited to, physical separation of stockpiles or construction of bulkheads of adequate length and height; and
- B. Contamination of aggregates by contact with the ground shall be positively prevented. The Contractor shall take the necessary measures to prevent contamination. The preventive measures shall include, but are not necessarily limited to, placing aggregates on wooden platforms or on hardened surfaces consisting of portland cement concrete, asphalt concrete, or cement treated material.

- In placing aggregates in storage or in moving the aggregates from storage to the weigh hopper of the batching plant, any method that may cause segregation, degradation, or the combining of materials of different gradings that will result in any size of aggregate at the weigh hopper failing to meet the grading requirements, shall be discontinued. Any method of handling aggregates that results in excessive breakage of particles shall be discontinued. The use of suitable devices to reduce impact of falling aggregates may be required by the Engineer.

90-5.02 PROPORTIONING DEVICES

- Weighing, measuring, or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, automatic weighing systems shall comply with the requirements for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." Automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.

- Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to ensure their accuracy.

- Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the mass of each batch of material shall not vary from the mass designated by the Engineer by more than the tolerances specified herein.

- Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance

shall be ± 0.5 percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated mass or volume.

- The mass indicated for any batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch mass of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch masses; and
- B. Cement shall be within 1.0 percent of its designated batch mass. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch mass. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch mass, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch masses; and
- C. Water shall be within 1.5 percent of its designated mass or volume.

- Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5-kg graduations.

90-5.03 PROPORTIONING

- Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture, and water as provided in these specifications. Aggregates shall be proportioned by mass.

- At the time of batching, aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

- Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

- Bulk "Type IP (MS) Modified" cement shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

- Bulk cement and mineral admixture may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

- When cement and mineral admixtures are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

- The scales and weigh hoppers for bulk weighing cement, mineral admixture, or cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

- For batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate scale and indicator for weighing each size of aggregate.
- B. Single box and scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

- In order to check the accuracy of batch masses, the gross mass and tare mass of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

90-5.03A Proportioning for Pavement

- Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to these specifications.
- The Contractor shall install and maintain in operating condition an electronically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.
- The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with masses that are within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- When interlocks are required for cement and mineral admixture charging mechanisms and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the mass of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture, or cement plus mineral admixture into the aggregate as directed by the Engineer.
- When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.
- Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and so that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.
- When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required mass is discharged into the weigh box, after which the gate shall automatically close and lock.
- The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

90-6 MIXING AND TRANSPORTING

90-6.01 GENERAL

- Concrete shall be mixed in mechanically operated mixers, except that when permitted by the Engineer, batches not exceeding 0.25 m³ may be mixed by hand methods in conformance with the provisions in Section 90-6.05, "Hand-Mixing."
- Equipment having components made of aluminum or magnesium alloys that would have contact with plastic concrete during mixing, transporting, or pumping of portland cement concrete shall not be used.
- Concrete shall be homogeneous and thoroughly mixed, and there shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.
- Uniformity of concrete mixtures will be determined by differences in penetration as determined by California Test 533, or slump as determined by ASTM Designation: C 143, and by variations in the proportion of coarse aggregate as determined by California Test 529.
- When the mix design specifies a penetration value, the difference in penetration, determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed 10 mm. When the mix design specifies a slump value, the difference in slump, determined by comparing slump tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed the values given in the table below. Variation in the proportion of coarse aggregate will be determined by comparing the results of tests of 2 samples of mixed concrete from the same batch or truck mixer load and the difference between the 2 results shall not exceed 100 kg per cubic meter of concrete.

Average Slump	Maximum Permissible Difference
Less than 100-mm	25-mm
100-mm to 150-mm	38-mm
Greater than 150-mm to 225-mm	50-mm

- The Contractor, at the Contractor's expense, shall furnish samples of the freshly mixed concrete and provide satisfactory facilities for obtaining the samples.

90-6.02 MACHINE MIXING

- Concrete mixers may be of the revolving drum or the revolving blade type, and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. Mixers and agitators that have an accumulation of hard concrete or mortar shall not be used.
- The temperature of mixed concrete, immediately before placing, shall be not less than 10°C or more than 32°C. Aggregates and water shall be heated or cooled as necessary to produce concrete within these temperature limits. Neither aggregates nor mixing water shall be heated to exceed 65°C. If ice is used to cool the concrete, discharge of the mixer will not be permitted until all ice is melted.
- The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one - fourth of the specified mixing time.
- Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions that reduce or vary the required quantity of cementitious material in the concrete mixture.
- Paving and stationary mixers shall be operated with an automatic timing device. The timing device and discharge mechanism shall be interlocked so that during normal operation no part of the batch will be discharged until the specified mixing time has elapsed.
 - The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.
 - The size of batch shall not exceed the manufacturer's guaranteed capacity.
 - When producing concrete for pavement or base, suitable batch counters shall be installed and maintained in good operating condition at jobsite batching plants and stationary mixers. The batch counters shall indicate the exact number of batches proportioned and mixed.
 - Concrete shall be mixed and delivered to the jobsite by means of one of the following combinations of operations:
 - A. Mixed completely in a stationary mixer and the mixed concrete transported to the point of delivery in truck agitators or in non-agitating hauling equipment (central-mixed concrete).
 - B. Mixed partially in a stationary mixer, and the mixing completed in a truck mixer (shrink-mixed concrete).
 - C. Mixed completely in a truck mixer (transit-mixed concrete).
 - D. Mixed completely in a paving mixer.
- Agitators may be truck mixers operating at agitating speed or truck agitators. Each mixer and agitator shall have attached thereto in a prominent place a metal plate or plates on which is plainly marked the various uses for which the equipment is designed, the manufacturer's guaranteed capacity of the drum or container in terms of the volume of mixed concrete and the speed of rotation of the mixing drum or blades.
 - Truck mixers shall be equipped with electrically or mechanically actuated revolution counters by which the number of revolutions of the drum or blades may readily be verified.
 - When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements for transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing in a central plant.

90-6.03 TRANSPORTING MIXED CONCRETE

- Mixed concrete may be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturer of the equipment as agitating speed, or in non-agitating hauling equipment, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable for adequate placement and consolidation in place, and provided the mixed concrete after hauling to the delivery point conforms to the provisions in Section 90-6.01, "General."
 - Truck agitators shall be loaded not to exceed the manufacturer's guaranteed capacity and shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling.
 - Bodies of non-agitating hauling equipment shall be constructed so that leakage of the concrete mix, or any part thereof, will not occur at any time.
 - Concrete hauled in open-top vehicles shall be protected during hauling against rain or against exposure to the sun for more than 20 minutes when the ambient temperature exceeds 24°C.
 - No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced.

- The rate of discharge of mixed concrete from truck mixer-agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.
- When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours or before 250 revolutions of the drum or blades, whichever occurs first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time allowed may be less than 1.5 hours.
- When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.
- Each load of concrete delivered at the jobsite shall be accompanied by a weighmaster certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load, and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weighmaster certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.
- Weighmaster certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on a 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be "line feed, carriage return" (LFCR) and "one line, separate record" with allowances for sufficient fields to satisfy the amount of data required by these specifications.
- The Contractor may furnish a weighmaster certificate accompanied by a separate certificate that lists the actual batch masses or measurements for a load of concrete provided that both certificates are imprinted with the same non-repeating load number that is unique to the contract and delivered to the jobsite with the load.
- Weighmaster certificates furnished by the Contractor shall conform to the provisions in Section 9-1.01, "Measurement of Quantities."

90-6.04 TIME OR AMOUNT OF MIXING

- Mixing of concrete in paving or stationary mixers shall continue for the required mixing time after all ingredients, except water and admixture, if added with the water, are in the mixing compartment of the mixer before any part of the batch is released. Transfer time in multiple drum mixers shall not be counted as part of the required mixing time.
- The required mixing time, in paving or stationary mixers, of concrete used for concrete structures, except minor structures, shall be not less than 90 seconds or more than 5 minutes, except that when directed by the Engineer in writing, the requirements of the following paragraph shall apply.
- The required mixing time, in paving or stationary mixers, except as provided in the preceding paragraph, shall be not less than 50 seconds or more than 5 minutes.
- The minimum required revolutions at the mixing speed for transit-mixed concrete shall not be less than that recommended by the mixer manufacturer, but in no case shall the number of revolutions be less than that required to consistently produce concrete conforming to the provisions for uniformity in Section 90-6.01, "General."

90-6.05 HAND-MIXING

- Hand-mixed concrete shall be made in batches of not more than 0.25 m³ and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

90-6.06 AMOUNT OF WATER AND PENETRATION

- The amount of water used in concrete mixes shall be regulated so that the penetration of the concrete as determined by California Test 533 or the slump of the concrete as determined by ASTM Designation: C 143 is within the "Nominal" values shown in the following table. When the penetration or slump of the concrete is found to exceed the nominal values listed, the mixture of subsequent batches shall be adjusted to reduce the penetration or slump to a value within the nominal range shown. Batches of concrete with a penetration or slump exceeding the maximum values listed shall not be used in the work. When Type F or Type G chemical admixtures are added to the mix, the penetration requirements shall not apply and the slump shall not exceed 225 mm after the chemical admixtures are added.

Type of Work	Nominal		Maximum	
	Penetration (mm)	Slump (mm)	Penetration (mm)	Slump (mm)
Concrete Pavement	0-25	—	40	—
Non-reinforced concrete facilities	0-35	—	50	—
Reinforced concrete structures				
Sections over 300-mm thick	0-35	—	65	—
Sections 300-mm thick or less	0-50	—	75	—
Concrete placed under water	—	150-200	—	225
Cast-in-place concrete piles	65-90	130-180	100	200

- The amount of free water used in concrete shall not exceed 183 kg/m³, plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m³.
- The term free water is defined as the total water in the mixture minus the water absorbed by the aggregates in reaching a saturated surface-dry condition.
- Where there are adverse or difficult conditions that affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic meter of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 kg of water per added 100 kg of cementitious material per cubic meter. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.
- The equipment for supplying water to the mixer shall be constructed and arranged so that the amount of water added can be measured accurately. Any method of discharging water into the mixer for a batch shall be accurate within 1.5 percent of the quantity of water required to be added to the mix for any position of the mixer. Tanks used to measure water shall be designed so that water cannot enter while water is being discharged into the mixer and discharge into the mixer shall be made rapidly in one operation without dribbling. All equipment shall be arranged so as to permit checking the amount of water delivered by discharging into measured containers.

90-7 CURING CONCRETE

90-7.01 METHODS OF CURING

- Newly placed concrete shall be cured by the methods specified in this Section 90-7.01 and the special provisions.

90-7.01A Water Method

- The concrete shall be kept continuously wet by the application of water for a minimum curing period of 7 days after the concrete has been placed.
 - When a curing medium consisting of cotton mats, rugs, carpets, or earth or sand blankets is to be used to retain the moisture, the entire surface of the concrete shall be kept damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate on the concrete in a quantity sufficient to cause a flow or wash the surface. At the expiration of the curing period, the concrete surfaces shall be cleared of all curing mediums.
 - When concrete bridge decks and flat slabs are to be cured without the use of a curing medium, the entire surface of the bridge deck or slab shall be kept damp by the application of water with an atomizing nozzle as specified in the preceding paragraph, until the concrete has set, after which the entire surface of the concrete shall be sprinkled continuously with water for a period of not less than 7 days.

90-7.01B Curing Compound Method

- Surfaces of the concrete that are exposed to the air shall be sprayed uniformly with a curing compound.
- Curing compounds to be used shall be as follows:
 1. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B, except the resin type shall be poly-alpha-methylstyrene.
 2. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B.
 3. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class A.
 4. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class B.

5. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class A.
6. Non-pigmented curing compound with fugitive dye conforming to the requirements in ASTM Designation: C 309, Type 1-D, Class A.

- The infrared scan for the dried vehicle from curing compound (1) shall match the infrared scan on file at the Transportation Laboratory.

- The loss of water for each type of curing compound, when tested in conformance with the requirements in California Test 534, shall not be more than 0.15-kg/m² in 24 hours or more than 0.45-kg/m² in 72 hours.

- The curing compound to be used will be specified elsewhere in these specifications or in the special provisions.

- When the use of curing compound is required or permitted elsewhere in these specifications or in the special provisions and no specific kind is specified, any of the curing compounds listed above may be used.

- Curing compound shall be applied at a nominal rate of 3.7 m²/L, unless otherwise specified.

- At any point, the application rate shall be within ± 1.2 m²/L of the nominal rate specified, and the average application rate shall be within ± 0.5 m²/L of the nominal rate specified when tested in conformance with the requirements in California Test 535. Runs, sags, thin areas, skips, or holidays in the applied curing compound shall be evidence that the application is not satisfactory.

- Curing compounds shall be applied using power operated spray equipment. The power operated spraying equipment shall be equipped with an operational pressure gage and a means of controlling the pressure. Hand spraying of small and irregular areas that are not reasonably accessible to mechanical spraying equipment, in the opinion of the Engineer, may be permitted.

- The curing compound shall be applied to the concrete following the surface finishing operation, immediately before the moisture sheen disappears from the surface, but before any drying shrinkage or craze cracks begin to appear. In the event of any drying or cracking of the surface, application of water with an atomizing nozzle as specified in Section 90-7.01A, "Water Method," shall be started immediately and shall be continued until application of the compound is resumed or started; however, the compound shall not be applied over any resulting freestanding water. Should the film of compound be damaged from any cause before the expiration of 7 days after the concrete is placed in the case of structures and 72 hours in the case of pavement, the damaged portion shall be repaired immediately with additional compound.

- At the time of use, compounds containing pigments shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. A paddle shall be used to loosen all settled pigment from the bottom of the container, and a power driven agitator shall be used to disperse the pigment uniformly throughout the vehicle.

- Agitation shall not introduce air or other foreign substance into the curing compound.

- The manufacturer shall include in the curing compound the necessary additives for control of sagging, pigment settling, leveling, de-emulsification, or other requisite qualities of a satisfactory working material. Pigmented curing compounds shall be manufactured so that the pigment does not settle badly, does not cake or thicken in the container, and does not become granular or curdled. Settlement of pigment shall be a thoroughly wetted, soft, mushy mass permitting the complete and easy vertical penetration of a paddle. Settled pigment shall be easily redispersed, with minimum resistance to the sideways manual motion of the paddle across the bottom of the container, to form a smooth uniform product of the proper consistency.

- Curing compounds shall remain sprayable at temperatures above 4°C and shall not be diluted or altered after manufacture.

- The curing compound shall be packaged in clean 210-L barrels or round 19-L containers or shall be supplied from a suitable storage tank located at the jobsite. The containers shall comply with "Title 49, Code of Federal Regulations, Hazardous Materials Regulations." The 210-L barrels shall have removable lids and airtight fasteners. The 19-L containers shall be round and have standard full open head and bail. Lids with bungholes shall not be permitted. On-site storage tanks shall be kept clean and free of contaminants. Each tank shall have a permanent system designed to completely redisperse settled material without introducing air or other foreign substances.

- Steel containers and lids shall be lined with a coating that will prevent destructive action by the compound or chemical agents in the air space above the compound. The coating shall not come off the container or lid as skins. Containers shall be filled in a manner that will prevent skinning. Plastic containers shall not react with the compound.

- Each container shall be labeled with the manufacturer's name, kind of curing compound, batch number, volume, date of manufacture, and volatile organic compound (VOC) content. The label shall also warn that the curing compound containing pigment shall be well stirred before use. Precautions concerning the handling and the application of curing compound shall be shown on the label of the curing compound containers in conformance with the Construction Safety Orders and General Industry Safety Orders of the State of California.

- Containers of curing compound shall be labeled to indicate that the contents fully comply with the rules and regulations concerning air pollution control in the State of California.

- When the curing compound is shipped in tanks or tank trucks, a shipping invoice shall accompany each load. The invoice shall contain the same information as that required herein for container labels.

- Curing compound will be sampled by the Engineer at the source of supply or at the jobsite or at both locations.
- Curing compound shall be formulated so as to maintain the specified properties for a minimum of one year. The Engineer may require additional testing before use to determine compliance with these specifications if the compound has not been used within one year or whenever the Engineer has reason to believe the compound is no longer satisfactory.
- Tests will be conducted in conformance with the latest ASTM test methods and methods in use by the Transportation Laboratory.

90-7.01C Waterproof Membrane Method

- The exposed finished surfaces of concrete shall be sprayed with water, using a nozzle that so atomizes the flow that a mist and not a spray is formed, until the concrete has set, after which the curing membrane shall be placed. The curing membrane shall remain in place for a period of not less than 72 hours.
- Sheeting material for curing concrete shall conform to the requirements in AASHTO Designation: M 171 for white reflective materials.
- The sheeting material shall be fabricated into sheets of such width as to provide a complete cover for the entire concrete surface. Joints in the sheets shall be securely cemented together in such a manner as to provide a waterproof joint. The joint seams shall have a minimum lap of 100 mm.
- The sheets shall be securely weighted down by placing a bank of earth on the edges of the sheets or by other means satisfactory to the Engineer.
- Should any portion of the sheets be broken or damaged before the expiration of 72 hours after being placed, the broken or damaged portions shall be immediately repaired with new sheets properly cemented into place.
- Sections of membrane that have lost their waterproof qualities or have been damaged to such an extent as to render them unfit for curing the concrete shall not be used.

90-7.01D Forms-In-Place Method

- Formed surfaces of concrete may be cured by retaining the forms in place. The forms shall remain in place for a minimum period of 7 days after the concrete has been placed, except that for members over 0.5-m in least dimension the forms shall remain in place for a minimum period of 5 days.
- Joints in the forms and the joints between the end of forms and concrete shall be kept moisture tight during the curing period. Cracks in the forms and cracks between the forms and the concrete shall be resealed by methods subject to the approval of the Engineer.

90-7.02 CURING PAVEMENT

- The entire exposed area of the pavement, including edges, shall be cured by the waterproof membrane method, or curing compound method using curing compound (1) or (2) as the Contractor may elect. Should the side forms be removed before the expiration of 72 hours following the start of curing, the exposed pavement edges shall also be cured. If the pavement is cured by means of the curing compound method, the sawcut and all portions of the curing compound that have been disturbed by sawing operations shall be restored by spraying with additional curing compound.
- Curing shall commence as soon as the finishing process provided in Section 40-1.10, "Final Finishing," has been completed. The method selected shall conform to the provisions in Section 90-7.01, "Methods of Curing."
- When the curing compound method is used, the compound shall be applied to the entire pavement surface by mechanical sprayers. Spraying equipment shall be of the fully atomizing type equipped with a tank agitator that provides for continual agitation of the curing compound during the time of application. The spray shall be adequately protected against wind, and the nozzles shall be so oriented or moved mechanically transversely as to result in the minimum specified rate of coverage being applied uniformly on exposed faces. Hand spraying of small and irregular areas, and areas inaccessible to mechanical spraying equipment, in the opinion of the Engineer, will be permitted. When the ambient air temperature is above 15°C, the Contractor shall fog the surface of the concrete with a fine spray of water as specified in Section 90-7.01A, "Water Method." The surface of the pavement shall be kept moist between the hours of 10:00 a.m. and 4:30 p.m. on the day the concrete is placed. However, the fogging done after the curing compound has been applied shall not begin until the compound has set sufficiently to prevent displacement. Fogging shall be discontinued if ordered in writing by the Engineer.

90-7.03 CURING STRUCTURES

- Newly placed concrete for cast-in-place structures, other than highway bridge decks, shall be cured by the water method, the forms-in-place method, or, as permitted herein, by the curing compound method, in conformance with the provisions in Section 90-7.01, "Methods of Curing."
- The curing compound method using a pigmented curing compound may be used on concrete surfaces of construction joints, surfaces that are to be buried underground, and surfaces where only Ordinary Surface Finish is to be

applied and on which a uniform color is not required and that will not be visible from a public traveled way. If the Contractor elects to use the curing compound method on the bottom slab of box girder spans, the curing compound shall be curing compound (1).

- The top surface of highway bridge decks shall be cured by both the curing compound method and the water method. The curing compound shall be curing compound (1).
- Concrete surfaces of minor structures, as defined in Section 51-1.02, "Minor Structures," shall be cured by the water method, the forms-in-place method or the curing compound method.
- When deemed necessary by the Engineer during periods of hot weather, water shall be applied to concrete surfaces being cured by the curing compound method or by the forms-in-place method, until the Engineer determines that a cooling effect is no longer required. Application of water for this purpose will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."

90-7.04 CURING PRECAST CONCRETE MEMBERS

• Precast concrete members shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing." Curing shall be provided for the minimum time specified for each method or until the concrete reaches its design strength, whichever is less. Steam curing may also be used for precast members and shall conform to the following provisions:

- A. After placement of the concrete, members shall be held for a minimum 4-hour presteaming period. If the ambient air temperature is below 10°C, steam shall be applied during the presteaming period to hold the air surrounding the member at a temperature between 10°C and 32°C.
- B. To prevent moisture loss on exposed surfaces during the presteaming period, members shall be covered as soon as possible after casting or the exposed surfaces shall be kept wet by fog spray or wet blankets.
- C. Enclosures for steam curing shall allow free circulation of steam about the member and shall be constructed to contain the live steam with a minimum moisture loss. The use of tarpaulins or similar flexible covers will be permitted, provided they are kept in good repair and secured in such a manner as to prevent the loss of steam and moisture.
- D. Steam at the jets shall be at low pressure and in a saturated condition. Steam jets shall not impinge directly on the concrete, test cylinders, or forms. During application of the steam, the temperature rise within the enclosure shall not exceed 22°C per hour. The curing temperature throughout the enclosure shall not exceed 65°C and shall be maintained at a constant level for a sufficient time necessary to develop the required transfer strength. Control cylinders shall be covered to prevent moisture loss and shall be placed in a location where temperature is representative of the average temperature of the enclosure.
- E. Temperature recording devices that will provide an accurate, continuous, permanent record of the curing temperature shall be provided. A minimum of one temperature recording device per 60 m of continuous bed length will be required for checking temperature.
- F. Members in pretension beds shall be detensioned immediately after the termination of steam curing while the concrete and forms are still warm, or the temperature under the enclosure shall be maintained above 15°C until the stress is transferred to the concrete.
- G. Curing of precast concrete will be considered completed after termination of the steam curing cycle.

90-7.05 CURING PRECAST PRESTRESSED CONCRETE PILES

• Newly placed concrete for precast prestressed concrete piles shall be cured in conformance with the provisions in Section 90-7.04, "Curing Precast Concrete Members," except that piles with a class designation ending in C (corrosion resistant) shall be cured as follows:

- A. Piles shall be either steam cured or water cured. If water curing is used, the piles shall be kept continuously wet by the application of water in conformance with the provisions in Section 90-7.01A, "Water Method."
- B. If steam curing is used, the steam curing provisions in Section 90-7.04, "Curing Precast Concrete Members," shall apply except that the piles shall be kept continuously wet for their entire length for a period of not less than 3 days, including the holding and steam curing periods.

90-7.06 CURING SLOPE PROTECTION

• Concrete slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."

- Concreted-rock slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing," or with a blanket of earth kept wet for 72 hours, or by sprinkling with a fine spray of water every 2 hours during the daytime for a period of 3 days.

90-7.07 CURING MISCELLANEOUS CONCRETE WORK

- Exposed surfaces of curbs shall be cured by pigmented curing compounds as specified in Section 90-7.01B, "Curing Compound Method."
- Concrete sidewalks, gutter depressions, island paving, curb ramps, driveways, and other miscellaneous concrete areas shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."
- Shotcrete shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."
- Mortar and grout shall be cured by keeping the surface damp for 3 days.
- After placing, the exposed surfaces of sign structure foundations, including pedestal portions, if constructed, shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."

90-8 PROTECTING CONCRETE

90-8.01 GENERAL

- In addition to the provisions in Section 7-1.16, "Contractor's Responsibility for the Work and Materials," the Contractor shall protect concrete as provided in this Section 90-8.
- Concrete shall not be placed on frozen or ice-coated ground or subgrade nor on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints.
- Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash of the concrete surface, unless the Contractor provides adequate protection against damage.
- Concrete that has been frozen or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

90-8.02 PROTECTING CONCRETE STRUCTURES

- Structure concrete and shotcrete used as structure concrete shall be maintained at a temperature of not less than 7°C for 72 hours after placing and at not less than 4°C for an additional 4 days. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.

90-8.03 PROTECTING CONCRETE PAVEMENT

- Pavement concrete shall be maintained at a temperature of not less than 4°C for 72 hours. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.
- Except as provided in Section 7-1.08, "Public Convenience," the Contractor shall protect concrete pavement against construction and other activities that abrade, scar, discolor, reduce texture depth, lower coefficient of friction, or otherwise damage the surface. Stockpiling, drifting, or excessive spillage of soil, gravel, petroleum products, and concrete or asphalt mixes on the surface of concrete pavement is prohibited unless otherwise specified in these specifications, the special provisions or permitted by the Engineer.
- When ordered by the Engineer or shown on the plans or specified in the special provisions, pavement crossings shall be constructed for the convenience of public traffic. The material and work necessary for the construction of the crossings, and their subsequent removal and disposal, will be paid for at the contract unit prices for the items of work involved and if there are no contract items for the work involved, payment for pavement crossings will be made by extra work as provided in Section 4-1.03D, "Extra Work.". Where public traffic will be required to cross over the new pavement, Type III portland cement may be used in concrete, if permitted in writing by the Engineer. The pavement may be opened to traffic as soon as the concrete has developed a modulus of rupture of 3.8 MPa. The modulus of rupture will be determined by California Test 523.
- No traffic or Contractor's equipment, except as hereinafter provided, will be permitted on the pavement before a period of 10 days has elapsed after the concrete has been placed, nor before the concrete has developed a modulus of rupture of at least 3.8 MPa. Concrete that fails to attain a modulus of rupture of 3.8 MPa within 10 days shall not be opened to traffic until directed by the Engineer.
- Equipment for sawing weakened plane joints will be permitted on the pavement as specified in Section 40-1.08B, "Weakened Plane Joints."

- When requested in writing by the Contractor, the tracks on one side of paving equipment will be permitted on the pavement after a modulus of rupture of 2.4 MPa has been attained, provided that:
 - A. Unit pressure exerted on the pavement by the paver shall not exceed 135 kPa;
 - B. Tracks with cleats, grousers, or similar protuberances shall be modified or shall travel on planks or equivalent protective material, so that the pavement is not damaged; and
 - C. No part of the track shall be closer than 0.3-m from the edge of pavement.
- In case of visible cracking of, or other damage to the pavement, operation of the paving equipment on the pavement shall be immediately discontinued.
- Damage to the pavement resulting from early use of pavement by the Contractor's equipment as provided above shall be repaired by the Contractor at the Contractor's expense.
- The State will furnish the molds and machines for testing the concrete for modulus of rupture, and the Contractor, at the Contractor's expense, shall furnish the material and whatever labor the Engineer may require.

90-9 COMPRESSIVE STRENGTH

90-9.01 GENERAL

- Concrete compressive strength requirements consist of a minimum strength that shall be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or the special provisions or are shown on the plans.
- The compressive strength of concrete will be determined from test cylinders that have been fabricated from concrete sampled in conformance with the requirements of California Test 539. Test cylinders will be molded and initially field cured in conformance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in conformance with the requirements of California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.
- When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in conformance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.
- When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$14 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$20 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. Concrete represented by a single test that indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."
- If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but is 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the requirements in ASTM Designation: C 42.
- No single compressive strength test shall represent more than 250 m³.

- When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders that have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

- When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

- Certified test data, in order to be acceptable, shall indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

- Trial batch test reports, in order to be acceptable, shall indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches that were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

- Tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. Equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

- The certified test data and trial batch test reports shall include the following information:

- A. Date of mixing.
- B. Mixing equipment and procedures used.
- C. The size of batch in cubic meters and the mass, type, and source of all ingredients used.
- D. Penetration of the concrete.
- E. The air content of the concrete if an air-entraining admixture is used.
- F. The age at time of testing and strength of all concrete cylinders tested.

- Certified test data and trial batch test reports shall be signed by an official of the firm that performed the tests.

- When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.

- After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making changes that, in the judgment of the Engineer, could result in a strength of concrete below that specified.

- The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

- When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

90-10 MINOR CONCRETE

90-10.01 GENERAL

- Concrete for minor structures, slope paving, curbs, sidewalks and other concrete work, when designated as minor concrete on the plans, in the specifications, or in the contract item, shall conform to the provisions specified herein.

- The Engineer, at the Engineer's discretion, will inspect and test the facilities, materials and methods for producing the concrete to ensure that minor concrete of the quality suitable for use in the work is obtained.

90-10.02 MATERIALS

- Minor concrete shall conform to the following requirements:

90-10.02A Cementitious Material

- Cementitious material shall conform to the provisions in Section 90-1.01, "Description."

90-10.02B Aggregate

- Aggregate shall be clean and free from deleterious coatings, clay balls, roots, and other extraneous materials.
- The Contractor shall submit to the Engineer for approval, a grading of the combined aggregate proposed for use in the minor concrete. After acceptance of the grading, aggregate furnished for minor concrete shall conform to that grading, unless a change is authorized in writing by the Engineer.
 - The Engineer may require the Contractor to furnish periodic test reports of the aggregate grading furnished. The maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 37.5 mm or smaller than 19 mm.
 - The Engineer may waive, in writing, the gradation requirements in this Section 90-10.02B, if, in the Engineer's opinion, the furnishing of the gradation is not necessary for the type or amount of concrete work to be constructed.

90-10.02C Water

- Water used for washing, mixing, and curing shall be free from oil, salts, and other impurities that would discolor or etch the surface or have an adverse affect on the quality of the concrete.

90-10.02D Admixtures

- The use of admixtures shall conform to the provisions in Section 90-4, "Admixtures."

90-10.03 PRODUCTION

- Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice that will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and that conforms to requirements specified herein. Recognized standards of good practice are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or the Department.
 - The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."
 - The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.
 - Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32°C will be considered conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.
 - The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.
 - The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.
 - Each load of ready-mixed concrete shall be accompanied by a weighmaster certificate that shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weighmaster certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.
 - A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

90-10.04 CURING MINOR CONCRETE

- Curing minor concrete shall conform to the provisions in Section 90-7, "Curing Concrete."

90-10.05 PROTECTING MINOR CONCRETE

- Protecting minor concrete shall conform to the provisions in Section 90-8, "Protecting Concrete," except the concrete shall be maintained at a temperature of not less than 4°C for 72 hours after placing.

90-10.06 MEASUREMENT AND PAYMENT

- Minor concrete will be measured and paid for in conformance with the provisions specified in the various sections of these specifications covering concrete construction when minor concrete is specified in the specifications, shown on the plans, or indicated by contract item in the Engineer's Estimate.

90-11 MEASUREMENT AND PAYMENT

90-11.01 MEASUREMENT

- Portland cement concrete will be measured in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- When it is provided that concrete will be measured at the mixer, the volume in cubic meters shall be computed as the total mass of the batch in kilograms divided by the density of the concrete in kilograms per cubic meter. The total mass of the batch shall be calculated as the sum of all materials, including water, entering the batch. The density of the concrete will be determined in conformance with the requirements in California Test 518.

90-11.02 PAYMENT

- Portland cement concrete will be paid for in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- Full compensation for furnishing and incorporating admixtures required by these specifications or the special provisions will be considered as included in the contract prices paid for the concrete involved and no additional compensation will be allowed therefor.
- Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."
- Should the Contractor use admixtures in conformance with the provisions in Section 90-4.05, "Optional Use of Chemical Admixtures," or Section 90-4.07, "Optional Use of Air-entraining Admixtures," or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them into the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

END OF AMENDMENTS

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, Division Of Construction - Duty Senior, Mail Station: 3 - B, 111 Grand Avenue / P. O. Box 23660, Oakland, Ca 94623-0660, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of

this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.015 FEDERAL LOBBYING RESTRICTIONS

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto.
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company.
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
 - 1. The bidder will meet the goal by performing work with its own forces.
 - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.
 - 3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions.
- E. A DBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work.

- F. DBEs must be certified by the California Unified Certification Program (CUCP). It is the contractor's responsibility to confirm that the firm is DBE certified as of the date of bid opening. Listings of DBEs certified by the CUCP are available from the following sources:
1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.
 2. The Department's web site at <http://www.dot.ca.gov/hq/bep>.
 3. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.
- G. Credit for materials or supplies purchased from DBEs will be as follows:
1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
 2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.
 3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.
- H. Credit for DBE trucking companies will be as follows:
1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal.
 2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
 3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks its owns, insures, and operates using drivers it employs.
 4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
 6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.
- I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.
- J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 16 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

<p>Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10:</p> <p>Triaxial Management Services, Inc. - Oakland</p> <p>1545 Willow Street, 1st Floor Oakland, CA 94607 Telephone: (510) 286-1313 FAX No.: (510) 286-6792</p>	<p>Districts 08 and 11:</p> <p>Padilla & Associates - San Diego</p> <p>2725 Congress Street, Suite 1D San Diego, CA 92110 Telephone: (619) 725-0843 FAX No.: (619) 725-0854</p>
<p>Districts 07, 08, and 12; in San Luis Obispo and Santa Barbara Counties in District 05; and in Kern County in District 06:</p> <p>Padilla & Associates - Los Angeles</p> <p>5675 East Telegraph Rd., Suite A-260 Los Angeles, CA 90040 Telephone: (323) 728-8847 FAX No.: (323) 728-8867</p>	<p>Districts 01, 02, 03 and 09:</p> <p>Triaxial Management Services, Inc. - Sacramento</p> <p>930 Alhambra Blvd., #205 Sacramento, CA 95816 Telephone: (916) 553-4172 FAX No.: (916) 553-4173</p>

2-1.02B SUBMISSION OF DBE INFORMATION

The apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit the "CALTRANS BIDDER - DBE INFORMATION" form, and "GOOD FAITH EFFORTS DOCUMENTATION" (GFE) form if they have not met the goal, to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. ON THE FOURTH DAY, not including Saturdays, Sundays and legal holidays, following bid opening. DBE Information and GFE Documentation sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Other bidders need not submit DBE Information and GFE Documentation unless requested to do so by the Department. When a request is made by the Department, the DBE Information and GFE Documentation of the other bidders shall be received by the Department within 4 days of the request, not including Saturdays, Sundays and legal holidays, unless a later time is authorized by the Department.

Failure to submit the "CALTRANS BIDDER - DBE INFORMATION" form by the time specified will be grounds for finding the bid nonresponsive.

Where the bidder has not met the designated DBE goal, it must submit the GFE Documentation to establish that, prior to the bid, it made adequate good faith efforts to meet the goal.

Bidders are cautioned that even though their DBE Information indicates they will meet the stated DBE goal, they should also submit their GFE Documentation to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

If it is determined that GFE Documentation is needed to determine a bidder's eligibility for award, failure of the bidder to have submitted the "GOOD FAITH EFFORTS DOCUMENTATION" form by the time specified herein will be grounds for finding the bid or proposal nonresponsive.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation.

The bidder's DBE Information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a written confirmation from the DBE that is participating in the contract. A copy of the DBE's quote will serve as written confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE Information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The bidder's GFE Documentation shall demonstrate that, prior to bidding, adequate good faith efforts to meet the goal were made.

In order to demonstrate the bidder's adequate good faith efforts to meet the DBE goal, the bidder should include the following information and supporting documents, as necessary:

- A. The names and dates of each publication in which a request for DBE participation for the project was placed by the bidder. Attach copies of published advertisements or proofs of publication.
- B. The names of certified DBEs and the dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. Bidders are reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.
- C. Items of work the bidder has made available to DBE firms. Identify those items of work the bidder might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is the bidder's responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
- D. For each item of work made available, the selected firm and its status as a DBE, the DBEs that provided quotes, the price quote for each firm, the price difference for each DBE if the selected firm is not a DBE, and the name, address and telephone number for each firm. If the firm selected for the item is not a DBE, provide the reasons for the selection.
- E. Descriptions of the efforts made to provide interested DBEs with adequate information about the plans, specifications and requirements of the contract to assist them in responding to a solicitation. Where such information was provided by the bidder, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.
- F. Descriptions of any and all efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials (excluding supplies and equipment which the DBE subcontractor purchases or leases from the prime contractor or its affiliate). Where such assistance was provided by the bidder, identify the name of the DBE assisted, nature of the assistance offered, and date. Provide copies of supporting documents, as appropriate.
- G. The names of agencies, including the firms listed in Section 2-1.02A, "DBE Goal for this Project," and the dates on which they were contacted to provide assistance in contacting, recruiting and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
- H. Any additional data to support a demonstration of good faith efforts.

2-1.02C SMALL BUSINESS AND DISABLED VETERAN BUSINESS ENTERPRISE UTILIZATION AND REPORTING

Contractors, subcontractors, suppliers and service providers who qualify are requested to apply for certification as a "Small Business" or a "Disabled Veteran Business Enterprise" by submitting an application to the Department of General Services, Office of Small Business and DVBE Certification, 707 3rd Street, West Sacramento, CA 95605 Telephone No. (916) 375-4940 or (800) 559-5529.

Attention is directed to the provisions of the Small Business Procurement and Contract Act, Government Code Section 14835 et seq., and Title 2, California Code of Regulations, Section 1896 et seq. regarding certification as a Small Business,

and the provisions of Military and Veterans Code Section 999 et seq. and Title 2, California Code of Regulation, Section 1896.60 et seq. regarding certification as a Disabled Veteran Business Enterprise.

By Executive Orders Nos. D-37-01 and D-43-01 the Governor has declared that the policy of the State is to promote the use and participation of Small Businesses and Disabled Veteran Business Enterprises in the State contracting process. The Executive Orders seek pursuit of an annual 25 percent Small Business participation level, and the statutory 3 percent Disabled Veteran Business Enterprise participation level. Because this project involves Federal funding, the State Small Business preference and the State Disabled Veteran Business Enterprise goal do not apply. However, the Department desires to encourage the highest possible participation of Small Businesses and Disabled Veteran Business Enterprises to achieve the goals as stated in the Executive Orders.

It is requested that the Contractor provide, on a quarterly basis, and within 30 days of contract acceptance, reports summarizing the participation of State certified Small Businesses and Disabled Veteran Business Enterprises used in the performance of this contract. To qualify for payment, it is requested that each report include the contract number, Contractor name, business address, business telephone number, and name of person preparing the report, and that the report list payments to each Small Business or Disabled Veteran Business Enterprise by item number, description of work performed and materials provided, business name, Small Business or Disabled Veteran Business Enterprise certification number, amount of payment, date payment was made, and cumulative payment.

For each report submitted to the Engineer, the Contractor will receive \$2,500. The amount paid for submitting each report shall include full compensation for doing all the work involved in preparing and submitting the report, including accounting, tracking, maintaining, and reporting certified Small Business and Disabled Veteran Business Enterprise use.

2-1.03 ESCROW OF BID DOCUMENTATION

Bid documentation shall consist of all documentary and calculated information generated by the Contractor in preparation of the bid. The bid documentation shall conform to the requirements in these special provisions, and shall be submitted to the Department and held in escrow for the duration of the contract.

The escrowed bid documents will be the only documents accepted from the Contractor regarding preparation of the bid.

In signing the proposal, the bidder certifies that the material submitted for escrow constitutes all the documentary information used in preparation of the bid and that he has personally examined the contents of the container and that they are complete.

Nothing in the bid documentation shall be construed to change or modify the terms or conditions of the contract.

Escrowed bid documentation will not be used for pre-award evaluation of the Contractor's anticipated methods of construction, nor to assess the Contractor's qualifications for performing the work.

Bid documentation shall clearly itemize the Contractor's estimated costs of performing the work. The documentation submitted shall be complete and so detailed as to allow for an in-depth analysis of the Contractor's estimate.

The bid documentation shall include, but not be limited to: quantity takeoffs; rate schedules for the direct costs and the time- and nontime-related indirect costs for labor (by craft), plant and equipment ownership and operation, permanent and expendable materials, insurance and subcontracted work; estimated construction schedules, including sequence and duration and development of production rates; quotations, scoping documents and subcontracts related to subcontractors, manufacturers and suppliers; estimates of field and home office overhead; contingency and margin for each contract item of work; names of the persons responsible for preparing the bidder's estimate, and other reports, calculations, assumptions and information used by the bidder to arrive at the estimate submitted with the proposal.

The Contractor shall also submit bid documentation for each subcontractor, manufacturer and supplier whose total subcontract or purchase orders exceeds or is expected to exceed \$250,000. Subcontractor, manufacturer and supplier bid documentation shall be enclosed with the Contractor's submittal, regardless of whether or not subcontracts or purchase orders have been executed or entered into on the date that bid documentation is submitted for escrow. If at the time that bid documentation is submitted for escrow, the subcontractor, manufacturer or supplier does not have a executed subcontract or purchase orders, and a subcontract or purchase orders is subsequently executed, then a copy of the executed subcontract or purchase orders shall be submitted into escrow within 14 days of the execution of the respective subcontract or purchase orders. The examination of subcontractors', manufacturers' and suppliers' bid documentation will be accomplished in the same manner as for the Contractor's bid documentation. If a subcontractor, manufacturer or supplier is replaced, bid documentation for the new subcontractor, manufacturer or supplier shall be submitted for review and escrow before authorization for the substitution will be granted. Upon request of a subcontractor, manufacturer or supplier, the bid documentation from that subcontractor, manufacturer or supplier shall be reviewed only by the subcontractor, manufacturer or supplier and the Department.

If the bidder is a joint venture, the bid documentation shall include the joint venture agreement, the joint venture estimate comparison and final reconciliation of the joint venture estimate.

Copies of the proposals submitted by the first, second and third low bidders will be provided to the respective bidders for inclusion in the bid documentation to be escrowed.

The first, second, and third apparent low bidders shall present the bid documentation for escrow at the District 04 Office, 111 Grand Avenue, Oakland, CA, (510) 286-5209, on the first Tuesday between 1:00 p.m. and 2:00 p.m., following the time indicated in the "Notice to Contractors" for the opening of bids. The fourth and subsequent apparent low bidders shall present the bid documentation for escrow if requested by the Department to do so.

Bid documentation shall be submitted as a paper copy in a sealed container, clearly marked with the bidder's name, date of submittal, project contract number and the words, "Bid Documentation for Escrow."

Failure to submit the actual and complete bid documentation as specified herein within the time specified shall be cause for rejection of the proposal.

Upon submittal, the bid documentation of the apparent low bidder will be examined and inventoried by the duly designated representatives of the Contractor and the Department to ensure that the bid documentation is authentic, legible, and in accordance with the terms of this section "Escrow of Bid Documentation." The examination will not include review of, nor will it constitute approval of, proposed construction methods, estimating assumptions or interpretation of the contract. The examination will not alter any conditions or terms of the contract. The acceptance or rejection by the Department that the submitted bid documents are in compliance with this section "Escrow of Bid Documentation" shall be completed within 48 hours of the time the bid documentation is submitted by the Contractor.

At the completion of the examination, the bid documents will be sealed and jointly deposited at an agreed commercial business in Oakland, CA.

Bid documentation submitted by the second and third apparent low bidders will be jointly deposited at agreed commercial businesses. If the apparent low bid is withdrawn or rejected, the bid documentation of the second low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. If the second low bid is withdrawn or rejected, the bid documentation of the third low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. Bid documentation from subsequent bidders, if requested, will be examined and inventoried in the same manner as specified above, then sealed and deposited in escrow. Upon execution and final approval of the contract or rejection of all bids, the bid documentation will be returned to any remaining unsuccessful bidders.

Any and all components of the escrowed bid documentation may be examined by the designated representatives of both the Department and the Contractor, at any time deemed necessary by either the Department or the Contractor to assist in the negotiation of price adjustments and change orders, or to assist in the potential resolution or in the settlement of claims or disputes. Such a joint review shall be performed within 15 days of receipt of a written request to do so by either party. If the Contractor refuses to participate in the joint examination of any and all components of the escrowed bid documentation as provided herein, such refusal shall be considered as a failure by the Contractor to exhaust administrative claim remedies with respect to the particular protest, notice of potential claim, or claim. In addition, this refusal by the Contractor shall constitute a bar to future arbitration with respect to the protest, potential claim or claim as provided by Section 10240.2 of the California Public Contract Code.

If requested by a Disputes Review Board, the escrowed bid documentation may be utilized to assist the Board in its recommendations.

The bid documentation submitted by the Contractor will be held in escrow until the contract has been completed, the ultimate resolution of all disputes and claims has been achieved and receipt of final payment has been accepted by the Contractor. The escrowed bid documentation will then be released from escrow to the Contractor.

The bid documentation submitted by the bidder is, and shall remain, the property of the bidder, and is subject to only joint review by the Department and the bidder. The Department stipulates and expressly acknowledges that the submitted bid documentation constitutes trade secrets and will not be deemed public records. This acknowledgment is based on the Department's express understanding that the information contained in the bid documentation is not known outside the bidder's business, is known only to a limited extent and only by a limited number of employees of the bidder, is safeguarded while in the bidder's possession, is extremely valuable to the bidder and could be extremely valuable to the bidder's competitors by virtue of it reflecting the bidder's contemplated techniques of construction. The Department acknowledges that the bid documentation includes a compilation of information used in the bidder's business, intended to give the bidder an opportunity to obtain an advantage over competitors who do not know of or use the contents of the documentation. The Department agrees to safeguard the bid documentation, and all information contained therein, against disclosure, including disclosure of subcontractor bid documentation to the Contractor and other subcontractors to the fullest extent permitted by law. However, in the event of arbitration or litigation, the bid documentation shall be subject to discovery, and the Department assumes no responsibility for safeguarding the bid documentation unless the Contractor has obtained an appropriate protective order issued by the arbitrator or the court.

Full compensation for preparing the bid documentation, presenting it for escrow and reviewing it for escrow and upon request of the Engineer shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

The direct cost of depositing the bid documentation in escrow at the agreed commercial business will be paid by the State.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of the contract, if it be awarded, will be made within 30 days after the opening of the proposals if the apparent lowest bidder has met the goal for DBE participation. The award of the contract, if it be awarded, will be made within 60 days after the opening of the proposals if the apparent lowest bidder has not met the goal for DBE participation but has claimed good faith efforts to do so. These periods will be subject to extension for such further periods as may be agreed upon in writing between the Department and the bidders concerned. The award, if made, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the Department so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816.

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 15 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

A working day as defined in said Section 8-1.06 is re-defined for this project. Paragraph 2 through paragraph 5, inclusive, of said Section 8-1.06 shall not apply. Saturdays, Sundays and legal holidays, including days of inclement weather, will be counted as working days.

This work shall be diligently prosecuted to completion before the expiration of **146 WORKING DAYS** beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of **\$5,000 per day**, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

The 72 hour advanced notice before beginning work as referred to in said Section 8-1.03 of the Standard Specifications is changed to 24 hours advanced notice for this project.

Delays due to actions required by the Engineer performing normal inspection, testing and review duties shall be considered as included in the number of working days bid for completion of the contract and no extensions of time will be allowed for such actions in determining liquidated damages.

No incentive payments will be paid nor will disincentive deductions be charged on this project.

The time limit specified for the completion of the work contemplated herein is considered insufficient to permit completion of the work by the Contractor working a normal number of hours per day or week on a single shift basis. Should the Contractor fail to maintain the progress of the work in conformance with "Progress Schedule (Critical Path Method)" of these special provisions, additional shifts will be required to the extent necessary to ensure that the progress conforms to the above mentioned schedule and that the work will be completed within the time limit specified.

Full compensation for any additional costs occasioned by compliance with the provisions in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.01 WORKING DRAWINGS

Working drawings shall conform to the requirements in Section 5-1.02, " Plans and Working Drawings," of the Standard Specifications and these special provisions. Working drawings shall include supplements and calculations that are in addition to drawings.

Working drawings shall be submitted to the following location:

California Department of Transportation
Office of the Resident Engineer, Contract 04-0120Q4
280 Beale Street
San Francisco, CA 94105

Working drawings shall conform to the following:

- A. For initial review, 6 sets of the working drawings, shall be submitted. After the Engineer has determined that a submittal is complete, 12 additional sets shall be submitted.
- B. Drawings shall be 559 mm x 864 mm or 279 mm x 432 mm in size. Supplements and calculations shall be 216 mm x 280 mm in size.
- C. For drawings, text size shall be nominally 2.8 mm high, minimum. For supplement and calculations, font size shall be 12, minimum.
- D. Each working drawing sheet and each page of supplement or calculation, shall include the jobsite name of the structure as shown on the contract plans, District-County-Route-Kilometer Post, bridge number and contract number.
- E. Text and details shall be legible and suitable for photocopying and reduction.
- F. In addition to the paper copies of the working drawings, electronic files shall be submitted. Electronic files shall be portable document format (PDF) and shall be submitted on compact disk (CD) media. Each plan sheet shall be a separate PDF file on the CD. The electronic copy of the calculations and supplement shall be made into separate PDF files so that no more than 50 pages are included in a single file on the CD. The CD shall contain an index consisting of the file names and a description of the corresponding file contents. The files shall be listed in the sequence of: 1) index, 2) drawings, 3) supplement, and 4) calculations. If more than one CD is used for a given working drawing submittal, the index shall be included on each CD.
- G. Microfilms are required for approved shop drawings and shall be only a 24x reduction. The edge of the corrected original tracing image shall be clearly visible and visually parallel with the edges of the page. A clear, legible symbol shall be provided on the upper left side of each page to show the amount of reduction, and a horizontal and vertical scale shall be provided on each reduced print to facilitate enlargement to original scale.
- H. At the completion of the contract, one compiled set of all approved working drawings (in electronic form and including all corrections and revisions) shall be furnished to the Engineer. The index shall be the first file on the CD.
- I. At the completion of the contract, one set of reduced prints on 75-g/m² (minimum) bond paper, 279 mm x 432 mm in size, of the corrected original tracings of all approved working drawings, including all corrections and revisions shall be furnished to the Engineer. Reduced prints that are common to more than one structure shall be submitted for each structure. An index prepared specifically for the drawings for each structure containing sheet numbers and titles shall be included on the first reduced print in the set for each structure. Reduced prints for each structure shall be arranged in the order of drawing numbers shown in the index

Working drawings shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California. When independently checked calculations are required, these calculations shall be stamped and signed by another engineer who is registered as a Civil Engineer in the State of California.

Working drawings shall be submitted sufficiently in advance of the start of the affected work to allow time for review by the Engineer and correction by the Contractor of the drawings without delaying the work. The time shall be proportional to the complexity of the work, but in no case shall the time be less than the review time as specified for the type of working drawings as required elsewhere in these special provisions.

The Engineer will review a working drawing submittal for completeness. Within three working days of the receipt of the submittal by the Engineer, the Engineer will notify the Contractor in writing if the submittal is determined to be incomplete. If the submittal is determined to be complete, twenty working days from the day of receipt shall be allowed for approval or return for correction of each submittal or resubmittal, unless specified otherwise in the special provisions.

Should the Engineer fail to review the complete working drawing submittal within the time specified, and the Contractor's controlling operation on the critical path is delayed (as determined by the Engineer) by the Engineer's failure to

review within the time specified, an extension of time will be granted in conformance with the provisions in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and in "Progress Schedule (Critical Path Method)," of these special provisions. Should the Engineer fail to review the complete working drawing submittal within the time specified, compensation, if any, will be made in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and "Time Related Overhead," of these special provisions.

5-1.011 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

Attention is directed to "Differing Site Conditions" of these special provisions regarding physical conditions at the site which may differ from those indicated in "Materials Information," log of test borings or other geotechnical information obtained by the Department's investigation of site conditions.

5-1.012 DIFFERING SITE CONDITIONS

Attention is directed to Section 5-1.116, "Differing Site Conditions," of the Standard Specifications.

During the progress of the work, if subsurface or latent conditions are encountered at the site differing materially from those indicated in the "Materials Information," log of test borings, other geotechnical data obtained by the Department's investigation of subsurface conditions, or an examination of the conditions above ground at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

The Contractor will be allowed 15 days from the notification of the Engineer's determination of whether or not an adjustment of the contract is warranted, in which to file a notice of potential claim in conformance with the provisions of Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications and as specified herein; otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The notice of potential claim shall set forth in what respects the Contractor's position differs from the Engineer's determination and provide any additional information obtained by the Contractor, including but not limited to additional geotechnical data. The notice of potential claim shall be accompanied by the Contractor's certification that the following were made in preparation of the bid: a review of the contract, a review of the "Materials Information," a review of the log of test borings and other records of geotechnical data to the extent they were made available to bidders prior to the opening of bids, and an examination of the conditions above ground at the site. Supplementary information, obtained by the Contractor subsequent to the filing of the notice of potential claim, shall be submitted to the Engineer in an expeditious manner.

5-1.013 LINES AND GRADES

Attention is directed to Section 5-1.07, "Lines and Grades," of the Standard Specifications.

Stakes or marks will be set by the Engineer in conformance with the requirements in Chapter 12, "Construction Surveys," of the Department's Surveys Manual.

5-1.015 LABORATORY

When a reference is made in the specifications to the "Laboratory," the reference shall mean Division of Engineering Services - Materials Engineering and Testing Services and Division of Engineering Services - Geotechnical Services of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean Division of Engineering Services - Materials Engineering and Testing Services and Division of Engineering Services - Geotechnical Services, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

5-1.017 CONTRACT BONDS

Attention is directed to Section 3-1.02, "Contract Bonds," of the Standard Specifications and these special provisions.

The payment bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of the contract.

5-1.019 COST REDUCTION INCENTIVE

Attention is directed to Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

Prior to preparing a written cost reduction proposal, the Contractor shall request a meeting with the Engineer to discuss the proposal in concept. Items of discussion will also include permit issues, impact on other projects, impact on the project schedule, peer reviews, overall merit of the proposal, and review times required by the Department and other agencies.

If a cost reduction proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in contract time, 50 percent of that contract time reduction shall be credited to the State by reducing the contract

working days, not including plant establishment. Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions regarding the working days.

If a cost reduction proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in traffic congestion or avoids traffic congestion during construction, 60 percent of the estimated net savings in construction costs attributable to the cost reduction proposal will be paid to the Contractor. In addition to the requirements in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications, the Contractor shall provide detailed comparisons of the traffic handling between the existing contract and the proposed change, and estimates of the traffic volumes and congestion.

5-1.02 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM

(GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt State contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The specifications are applicable to all nonexempt State construction contracts and subcontracts of \$5000 or more.

5-1.022 PAYMENT OF WITHHELD FUNDS

Payment of withheld funds shall conform to Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications and these special provisions.

Funds withheld from progress payments to ensure performance of the contract that are eligible for payment into escrow or to an escrow agent pursuant to Section 10263 of the California Public Contract Code do not include funds withheld or deducted from payment due to failure of the Contractor to fulfill a contract requirement.

5-1.03 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments, and claim payments as follows:

- A. Unpaid progress payments, payment after acceptance, and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
- B. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in conformance with the provisions in Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
- C. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments, and extra work payments shall be 10 percent per annum.
- D. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.04 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:

1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
 2. Excavations less than 0.3-m deep.
 3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
 4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
 6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles.—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1999 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

Approach Speed of Public Traffic (Posted Limit) (Kilometers Per Hour)	Work Areas
Over 72 (45 Miles Per Hour)	Within 1.8 m of a traffic lane but not on a traffic lane
56 to 72 (35 to 45 Miles Per Hour)	Within 0.9-m of a traffic lane but not on a traffic lane

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.05 TESTING

Testing of materials and work shall conform to the provisions in Section 6-3, "Testing," of the Standard Specifications and these special provisions.

Whenever the provisions of Section 6-3.01, "General," of the Standard Specifications refer to tests or testing, it shall mean tests to assure the quality and to determine the acceptability of the materials and work.

The Engineer will deduct the costs for testing of materials and work found to be unacceptable, as determined by the tests performed by the Department, and the costs for testing of material sources identified by the Contractor which are not used for the work, from moneys due or to become due to the Contractor. The amount deducted will be determined by the Engineer.

5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.07 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California.

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product shall operate accurately in the manner in which the product was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.075 BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coatings that protect or enhance the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

5-1.08 SUBCONTRACTOR AND DBE RECORDS

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from

payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit claimed toward DBE participation conforms with Section 2-1.02, "Disadvantaged Business Enterprise," of these special provisions.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

5-1.083 DBE CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.09 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, and Section 2, "Proposal Requirements and Conditions," and Section 3, "Award and Execution of Contract," of these special provisions.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

<http://www.dir.ca.gov/DLSE/Debar.html>.

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the

original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

The requirement in Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these special provisions that DBEs must be certified on the date bids are opened does not apply to DBE substitutions after award of the contract.

5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

5-1.103 RECORDS

The Contractor shall maintain cost accounting records for the contract pertaining to, and in such a manner as to provide a clear distinction between, the following six categories of costs of work during the life of the contract:

- A. Direct costs of contract item work.
- B. Direct costs of changes in character in conformance with Section 4-1.03C, "Changes in Character of Work," of the Standard Specifications.
- C. Direct costs of extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.
- D. Direct costs of work not required by the contract and performed for others.
- E. Direct costs of work performed under a notice of potential claim in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications.
- F. Indirect costs of overhead.

Cost accounting records shall include the information specified for daily extra work reports in Section 9-1.03C, "Records," of the Standard Specifications. The requirements for furnishing the Engineer completed daily extra work reports shall only apply to work paid for on a force account basis.

The cost accounting records for the contract shall be maintained separately from other contracts, during the life of the contract, and for a period of not less than 3 years after the date of acceptance of the contract. If the Contractor intends to file claims against the Department, the Contractor shall keep the cost accounting records specified above until complete resolution of all claims has been reached.

5-1.11 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship is to maintain a cooperative communication and to mutually resolve conflicts at the lowest responsible management level.

The Contractor may request the formation of a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering Workshop," selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties. If agreed to by the parties, additional "Partnering Workshops" will be conducted as needed throughout the life of the contract.

A one-day "Training in Partnering Concepts" session will be conducted regardless of whether the Contractor requests the formation of a "Partnering" relationship. The "Training in Partnering Concepts" session will be conducted locally for the Contractor's and the Engineer's project representatives. The Contractor shall be represented by a minimum of 2 representatives, one being the Contractor's authorized representative pursuant to Section 5-1.06, "Superintendence," of the Standard Specifications. Scheduling of the "Training in Partnering Concepts" session and selection of the trainer and training site shall be determined cooperatively by the Contractor and the Engineer. Further, a one-day "Community Partnering Workshop" Partnering workshop to address issues of concern to the communities of Oakland and San Francisco and the City of Oakland and City and County of San Francisco. If, upon the Contractor's request, "Partnering" is approved by the Engineer, the "Training in Partnering Concepts" session and "Community Partnering Workshop" shall be conducted prior to the initial "Partnering Workshop."

The costs involved in providing the "Training in Partnering Concepts" and "Community Partnering Workshop", the trainer and training site will be borne entirely by the State. The costs will be determined in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor the sum of that cost, except no markups will be allowed.

The costs involved in providing the "Partnering Workshop" facilitator and workshop site will be borne equally by the State and the Contractor. The division of cost will be made by determining the cost in providing the "Partnering Workshop" facilitator and workshop site in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost, except no markups will be allowed.

All other costs associated with "Training in Partnering Concepts" and "Partnering Workshops" will be borne separately by the party incurring the costs, such as wages and travel expenses, and no additional compensation will be allowed therefor.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.114 CORRIDOR VALUE ANALYSIS

Attention is directed to "Cooperation" of these special provisions.

The Contractor shall attend a "SFOBB Corridor Value Analysis" workshop on a semi-annual basis until project acceptance. It is anticipated that one or more other contractors, pursuant to "Cooperation" of these special provisions, will also participate in the workshop. The purpose for having a workshop is to identify value enhancing opportunities and to consider modifications to the plans and specifications of any and all corridor projects that will reduce either the total corridor cost, time of construction or traffic congestion, without impairing, in any manner, the essential functions or characteristics of this contract or any other corridor construction contract including, but not limited to, service life, economy of operation, ease of maintenance, benefits to the travelling public, desired appearance, or design and safety standards. The workshop shall focus on potential enhancing opportunities which would result in any and all corridor construction contractors meeting their respective contractual milestones, early completion of any and all corridor construction contract's designated portions of work and project completion dates, and mitigating delays to any and all corridor construction contracts.

Scheduling of a workshop, selecting the facilitator and workshop site, and other administrative details shall be determined cooperatively by the Contractor and the Engineer. The workshop shall be conducted in conformance with the methodology described in the Department's "Value Analysis Team Guide" available at the Department's web site at:

<http://www.dot.ca.gov/hq/oppd/value/>

The facilitator shall be a Certified Value Specialist (CVS) as recognized by the Society of American Value Engineers (SAVE) International, which may be contacted as follows:

SAVE International, 60 Revere Drive, Northbrook, IL 60062
Telephone 1-847-480-1730, FAX 1-847-480-9282

In addition to the above provisions relative to the semi-annual "SFOBB Corridor Value Analysis" workshop, the Contractor may submit to the Engineer, in writing, a request for a project-specific "Value Analysis" workshop with no other corridor construction contractors in attendance. To maximize the potential benefits of a workshop, the request should be submitted to the Engineer early in the project after approval of the contract.

The Contractor may submit recommendations resulting from a "Value Analysis" workshop for approval by the Engineer as cost reduction incentive proposals in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

The costs involved in providing the "Value Analysis" facilitator and workshop site for the semi-annual "SFOBB Corridor Value Analysis" workshop shall be borne by the State in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, except no markups will be allowed.

The costs involved in providing the "Value Analysis" facilitator and workshop site for the project-specific "Value Analysis" workshop shall be borne equally by the State and the Contractor. The division of cost will be made by determining the cost in providing the "Value Analysis" facilitator and workshop site in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost, except no markups will be allowed.

All other costs including, but not limited to, wages and travel expenses, associated with the semi-annual "SFOBB Corridor Value Analysis" workshop and "Value Analysis" workshop will be borne separately by the party incurring the costs, and no additional compensation will be allowed therefor.

5-1.12 PROJECT INFORMATION

The data and information furnished or referred to below is for the bidders' or contractors' information, and is available on CD ROMs. The data and information is subject to the conditions and limitations set forth in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," and Section 6-2, "Local Materials," of the Standard Specifications. Bidders and contractors may request data and information in conformance to the procedures available at the office of the district for which the work is situated.

INFORMATION HANDOUT

Geotechnical Materials Information

Data and information shown in the Materials Information are:

1. Ground Motion Report: Main Text and Appendices
2. Final Marine Geophysical Survey Report:
Volume-1, Main Text and Appendices
3. Final Marine Geotechnical Site Characterization Report:
Volume-1, Main Text and Illustrations. Volume-2A through Volume-2H
4. Phase-I Subcontractor Reports:
Volume-1 through Volume-4
5. Phase-II Subcontractor Reports:
Volume-1 through Volume-3
6. Final Yerba Buena Island Geotechnical Site Characterization Report:
Volume-1, Main Text, Volume-2 through 4
7. Geotechnical Foundation Report for the Yerba Buena Island Approach and Self-Anchored Suspension Bridge

District Materials Information

Items shown in the Materials Information are:

- a. Regulation, Permits, agreement, consultation letter, or Biological Opinion:
 - 1- California Department of Fish and Game, Copies of the permit
 - 2- California Regional Water Quality Control Board, Copies of the Order and the Waste Discharge Requirements
 - 3- United States Army Corps of Engineers, Copies of the permit
 - 4- San Francisco Bay Conservation Development Commission, Copies of the permit
 - 5- United States Coast Guard, a USCG Bridge Permit
 - 6- United States Fish and Wildlife Service, Copies of the Biological Opinion
 - 7- Memorandum of Agreement (MOA) Between The United States Coast Guard The State of California, Department of Transportation
 - 8- USCG License No. DTCG-Z71111-03-RP-002L and License No. DTCG-Z71111-03-RP-010L
- b. Archaeological Survey Reports
- c. SFOBB East Span Survey Info
- d. Geotechnical & Material Report for YBI
- e. YBI Site Investigation Report
- f. Underwater Debris
- g. Asbestos and Lead Survey Report for Building No. 75
- h- Project Special Forms 100 through 400

MATERIALS INFORMATION AVAILABLE FOR INSPECTION

Items available for inspection, upon written request, at the office of the Duty Senior at the District 4 Office, 111 Grand Avenue, Oakland, CA 94612, email: duty_senior_district04@dot.ca.gov, telephone (510) 286-5209 are as follows:

- 1. Final Environmental Impact Statement/California Environmental Quality Act (CEQA) Statutory Exemption and Record of Decision;
- 2. BCDC Permit Application and permit;
- 3. Application for Water Quality Certification from the RWQCB;
- 4. RWQCB 401 Certification;
- 5. Waste Discharge Requirements from the RWQCB;
- 6. Order No. 01-100, NPDES General Permit No. CAG912002 from SFRWQCB
- 7. ACOE 404 Permit Application and Permit;
- 8. USCG Permit Application and Permit;
- 9. Caltrans letters to the Dredged Material Management Office with draft disposal plan;
- 10. USFWS Biological Opinion for brown pelicans and least terns;
- 11. CDFG 2081 Incidental Take Statement;
- 12. Soil samples and rock cores

5-1.13 NON-JOURNEY PERSON TRAINING PROGRAM

This provision supplements the Federal Trainee Program as part of the Contractor's equal employment opportunity affirmative action program.

In addition to the Federal Trainee Program, the Contractor may elect to provide training for apprentices or trainees, herein referred to as trainees, under the contract as established in this special provision. The Contractor shall notify the Engineer in writing of the Contractor's intent to provide training under this special provision no later than 20 calendar days following award of contract.

If the Contractor elects to provide on-the job training in accordance with this special provision, the goal for the number of trainees to be trained under the requirements of this special provision will be determined by the ratios approved by the State Department of Industrial Relations, Division of Apprenticeship Standards (DAS). The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and availability of journeymen in the various classifications within a reasonable area of recruitment.

In the event the Contractor subcontracts a portion of contract work, the Contractor may further assign a portion of the training requirements established herein to the subcontractor. Any further assignment of these training requirements by the Contractor shall be submitted in writing to the Engineer and an appropriately amended Training Program shall be made applicable to such subcontract. Where feasible, 25 percent of trainees in each occupation shall be in their first year of apprenticeship or training.

Approval or acceptance of a Training Program shall be obtained from the State prior to commencing work on the classification covered by the program. The Contractor shall also submit to the Engineer the number of trainees to be trained in each selected classification and training program to be used. The minimum length and type of training for each classification will be as established in the Training Program selected by the Contractor and approved by both the State and the Federal Highway Administration (FHWA). The State and FHWA will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journey person status in the classification specified by the end of the training period. Furthermore, training programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the DAS and recognized by the Bureau, and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided they are being administered in a manner consistent with the equal employment obligations of Federal-Aid highway construction contracts. Any trainee not enrolled in one of the aforementioned programs shall be paid not less than the prevailing wage at the journey person level. Furthermore, the Contractor shall specify the starting time for training in each of the classifications.

The Contractor, upon the start of training under the contract, shall provide the Engineer with following information for each trainee:

- A. Name
- B. Address
- C. Telephone Number
- D. Social Security Number
- E. Race/Ethnic Origin
- F. Gender
- G. Classification to be Trained In
- H. Status in Training Program (1st half ,third quarter, last quarter)
- I. Date Training Will Begin.
- J. The Anticipated Number of Hours Required for Training.
- K. Classification(s) Previously Trained in and Data Training was Completed.

The Contractor, prior to start of training, shall provide written notice to each person to be trained under this special provision of that person's designation as a trainee, the training program and classification under which training will be provided, the length of the training program, and the hourly wage rate to be paid to the trainee.

No employee shall be employed as a trainee in any classification in which the employee has successfully completed a training course, or in which the employee has been employed as a journey person. The Contractor shall satisfy this requirement by including appropriate questions in the employee application or by other suitable means. The Contractor shall document the findings in each case.

Except as otherwise noted below, the Contractor will be reimbursed \$2.00 per hour of on-site training or work on this contract for trainees, in addition to the amount specified in the Federal Trainee Program. This reimbursement may be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Compensation will be extra work, as specified in Section 4-1.03D of the Standard Specifications, except no markups will be added. The total amount of compensation shall be limited to \$13,000.

5-1.14 MONITORING

In addition to the requirements elsewhere in these special provisions, the Contractor shall designate an officer responsible for monitoring activities related to DBEs, City and County of San Francisco and Oakland Resources and Affirmative Action/Equal Employment Opportunity, and to report the employment, business and Affirmative Action/Equal Employment Opportunity utilization for the Contractor and subcontractors. The Contractor's officer shall present a monthly report at a single monthly forum to be conducted at the locations, dates and times designated by the Engineer.

Attention is directed to "Project Information," of these special provisions, regarding the project special forms 100 through 400. The Contractor designated officer responsible for monitoring activities shall use the project special forms 100 through 400 as specified by these special provisions.

At the first monthly forum, to be held within 20 calendar days following the approval of the contract, the Contractor and each of the subcontractors performing work of \$10,000 or more and working within the first six months of the project shall submit the following for information purposes:

1. The Anticipated Workforce Utilization Form. This form shall be based on the total anticipated hours for the project, on a craft-by-craft basis (use Project Special Form 100).

2. The DBE and LBE (Local Business Enterprise) Utilization Form (use Project Special Form 200).
3. A bar chart showing the approximate schedule and duration of the work to be performed by the Contractor and each subcontractor.

The second and subsequent reports shall document on both a monthly and cumulative basis, the following information:

1. For each subcontractor, manufacturer, supplier and trucker, by craft: the items and quantities of work performed, amount and date of compensation paid, status as a DBE, and business address (use Project Special Form 300); and
2. For the Contractor, and for each subcontractor and trucker performing work of \$10,000 or more, an updated version of the Project Special Form 200 which tracks employment status for each craft, including: the number of hours worked and the total number of employees classified as non-minorities, minorities, male, female, and Oakland residents. In addition, provide the city and zip code of legal residence for each trade used (use Project Special Form 400).
3. For the Contractor, and for each subcontractor performing work of \$10,000 or more, a projection of the workforce to be utilized for the upcoming 30 days (use Special Project Form 100)

At the third monthly forum of the contract, the Contractor shall submit a bar chart showing the approximate craft-by-craft schedule of trades to be utilized on the project. Resources outlined in "Progress Schedule (Critical Path Method)" of these special provisions may be utilized to generate and update the bar charts.

All reports shall be written and presented in the number of copies directed by the Engineer for use at the monthly forum, not to exceed 50 copies.

A final report summarizing all previous monthly reports shall be submitted within 30 days after contract acceptance.

The Contractor will receive \$5,000 for each month in which the Contractor presents a monthly report at the monthly forum and when the Contractor submits the final report. The amount paid each month for presenting the monthly reports or for submitting the final report shall include all markups, full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in preparing and presenting monthly reports, including copies of the reports, as specified in these special provisions and as directed by the Engineer.

5-1.15 ELECTRONIC DAILY EXTRA WORK REPORT

Attention is directed to Sections 5-1.10, "Equipment and Plants," 7-1.01A(3), "Payroll Records," 9-1.03C, "Records," and 9-1.06, "Partial Payments," of the Standard Specifications and these special provisions.

Daily extra work reports shall be furnished to the Engineer using the Department's electronic extra work billing system. The reports shall conform to the requirements set forth in the "Extra Work Billing System User's Guide." The Guide is available from the Department, and is also found on the Internet at http://www.dot.ca.gov/hq/construc/EWB_INSTRUCTION.pdf. The Department will provide electronic extra work billing system accounts to the Contractor's representatives only after they have received training. The Department will provide system training to the Contractor's authorized representatives within 30 days of the Contractor's request for training.

An account, user identification assigned by the Department, and password used by the Contractor's representative are deemed to meet the requirement in said Section 9-1.03C of the Standard Specifications that daily extra work reports shall be signed by the Contractor or the Contractor's authorized representative.

Daily extra work reports that include materials shall be substantiated by a valid copy of a vendor's invoice as required in Section 9-1.03C, "Records," of the Standard Specifications. Each invoice shall clearly identify the applicable electronic extra work report and the cost of the materials. In addition to postal service and parcel service, invoices may be sent by FAX or as an electronic-mail attachment, if approved by the Engineer.

The Engineer will compare the Engineer's records with the completed electronic daily extra work report. The Engineer will reject a report that has an error that affects payment, and will indicate the necessary adjustments the Contractor must make prior to sending a corrected electronic extra work report. A daily extra work report that the Contractor's representative sends to the Department using the electronic extra work billing system will be deemed to be signed by the Contractor. A daily extra work report that the Engineer approves using the electronic extra work billing system will be deemed to be signed by the Engineer.

Electronic submittals submitted by the file transfer process shall conform to the Department's specified format. The Contractor is responsible for maintaining the required data file format and requirements in the file transfer process. The Contractor is responsible for maintaining and operating the Contractor's interface with the Department's electronic extra work billing system.

Full compensation for furnishing daily extra work reports using the Department's electronic extra work billing system shall be considered as included in the various contract items involved and no separate payment will be made therefor.

5-1.16 AREAS FOR CONTRACTOR'S USE

Attention is directed to the requirements specified in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications, plans and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

Furthermore, the Contractor's attention is directed to "Cooperation," of these special provisions, and the Contractor shall use only the designated areas for Contractor's use as specified in this section, and as shown on the plans and as follows:

1. **Area QR:** it is designated for use by the contract 04-0120Q4 Contractor until contract completion.
2. **Area XQR:** it is available to both Contract 04-0120R4 and this contract. The Contractor shall coordinate any planned work in "Area XQR" with the Engineer and contractor of Contract 04-0120R4

The Contractor shall maintain access to the Torpedo Factory area at the east end of Yerba Buena Island at all times during the contract. Access may be via the existing Torpedo Factory Road or other routing as approved by the Engineer.

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk. The State shall not be held liable for damage to or loss of materials or equipment located within these areas.

The Contractor shall remove the equipment, materials, and rubbish from the work areas and other State-owned property which the Contractor occupies and shall leave the areas in a presentable condition, in conformance with the provisions in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

The Contractor shall secure, at the Contractor's own expense, areas required for storage of plant, equipment, and materials, or for other purposes if sufficient area is not available to the Contractor within the contract limits.

5-1.17 UTILITIES

The Contractor shall make arrangements to obtain electrical power, water or compressed air or other utilities required for the Contractor's operations and shall make and maintain the necessary service connections at the Contractor's own expense.

5-1.18 SANITARY PROVISIONS

State sanitary facilities will not be available for use by the Contractor's employees.

5-1.19 BRIDGE TOLLS

Toll-free passage on the San Francisco-Oakland Bay Bridge will be granted only for cars, trucks and special construction equipment which are clearly marked on the exterior with the Contractor's identification and which are being operated by the Contractor exclusively for the project, and which are used for the purpose of transporting materials and workers directly to and from the project site.

The Contractor shall make application to the Engineer in advance for toll-free passage. The Contractor will be held accountable for the proper use of passes issued, and upon completion of the work, shall return unused passes to the Engineer.

Attention is directed to Section 23302, "Evasion of Toll," of the Vehicle Code.

5-1.20 ACCESS TO PROJECT SITE

Prospective bidders may make arrangements to visit the project site by contacting the Duty Senior, District 04 Office, 111 Grand Avenue, Oakland, CA 94612, email: duty_senior_district04@dot.ca.gov, telephone number (510) 286-5209.

5-1.21 PERMITS AND LICENSES

Attention is directed to Section 7-1.04, "Permits and Licenses," of the Standard Specifications and these special provisions.

The Department has obtained the following permits for this project:

- A. California Regional Water Quality Control Board (RWQCB)
- B. U.S. Army Corps of Engineers (ACOE)
- C. San Francisco Bay Conservation Development Commission (BCDC)
- D. United States Coast Guard (USCG)
- E. California Department of Fish and Game (CDFG)

Copies of these permits can be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490 or may be seen and are available for inspection at the office of the Duty Senior, District 04 Office, 111 Grand Avenue, Oakland, CA 94612, email: duty_senior_district04@dot.ca.gov, telephone number (510) 286-5209.

A CD with the RWQCB, ACOE, BCDC, USCG and the CDFG permits has been made part of the information handout that is available to the Contractor.

Full compensation for conforming to the requirements in these permits shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.22 PAYMENTS

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

- | | |
|--|----------|
| A. Clearing and Grubbing | \$1,120 |
| B. Electronic Mobile Daily Diary Computer System Data Delivery | \$20,000 |
| C. Demolish Building | \$49,500 |

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

- A. Soldier pile for retaining wall
- B. Bar reinforcing steel
- C. Prefabricated Guard House
- D. Oil Filled Transformer
- E. Culvert pipe and appurtenances
- F. Sewer pipe and appurtenances
- G. Fence and gate

5-1.23 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

The noise level from the Contractor's operations, between the hours of 7:00 p.m. and 7:00 a.m., shall not exceed 78 dbA at a distance of 15 m (50 feet) from the source. Impact-type mechanical operations, such as pile-driving and jack-hammering shall not be conducted between the hours of 7:00 p.m. and 7:00 a.m. At all times, the Contractor shall be responsible for complying with local ordinances regulating noise levels as well as the sound requirements of this section.

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Noise monitoring activities will be conducted by the Department of Transportation. The Contractor shall coordinate with the Department of Transportation monitors and allow them access to noise monitoring locations.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.24 HAZARDOUS MATERIAL, GENERAL

Attention is directed to "Earthwork" of these special provisions regarding the removal and disposal of hazardous material described in this section.

Contaminants have been discovered through testing within the project limits. Testing consisted of collecting and analyzing in situ samples from within the project limits. Summary tables of the test results are included in the "Materials Information." The complete report entitled "Site Investigation Report, SFOBB East Span Seismic Safety Project, Yerba

Buena Island" is available for inspection at the office of the Duty Senior, 111 Grand Avenue, Oakland, CA 94612, email: duty_senior_district04@dot.ca.gov, telephone number (510) 286-5209, fax number; (510) 622-1805. These test results have been used for disposal characterization of material within the excavation limits and shall not be construed as identifying all locations within the project limits that contain contaminants.

Wherever the following terms are used in the contract documents, the meaning and intent shall be interpreted as provided below:

- A. Hazardous material – Material that contains contaminants at concentrations equal to or greater than the threshold limit concentrations listed in Section 66261.24 of Title 22 of the California Code of Regulations.
- B. Class II material – Material that contains contaminants, typically petroleum hydrocarbons, at concentrations that require handling of the material as a Designated Waste as defined in Section 13173 of the California Water Code but does not contain contaminants at concentrations equal to or greater than the threshold limit concentrations listed in Section 66261.24 of Title 22 of the California Code of Regulations. This material is unsuitable for reuse within the project limits.

Characterization and disposal of additional material resulting from excavations performed outside of the pay limits shown on the plans, specified in the Standard Specifications, or specified or directed by the Engineer, for the Contractor's convenience, shall be at the Contractor's expense. This resultant material shall be presumed to be either non-hazardous material or hazardous material if the test results for the location indicate that the material being excavated is non-hazardous material or hazardous material. The Contractor shall dispose of the resultant material in conformance with the provisions in "Earthwork" of these special provisions. When the material must be removed from highway right of way, the Contractor shall furnish replacement material suitable for the purpose intended in conformance with the provisions in Section 19, "Earthwork," of the Standard Specifications.

APPLICABLE RULES AND REGULATIONS

Excavation, transport and disposal of hazardous material shall be in conformance with the rules and regulations of the following agencies:

- United States Department of Transportation (USDOT)
- United States Environmental Protection Agency (USEPA)
- California Environmental Protection Agency (CAL-EPA)
 - 1. Department of Toxic Substance Control (DTSC)
 - 2. Integrated Waste Management Board
 - 3. Regional Water Quality Control Board, Region 2 (RWQCB)
 - 4. State Air Resources Board
- Bay Area Air Quality Management District (BAAQMD)
- California Division of Occupational Safety and Health Administration (CAL-OSHA)

PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying hazardous material, in conformance with the provisions in Section 7-1.04, "Permits and Licenses," of the Standard Specifications.

The Engineer will obtain the Environmental Protection Agency Generator Identification Number and Board of Equalization Identification Number and sign all manifests as the Generator.

SITE HEALTH AND SAFETY PLAN

The Contractor shall prepare a detailed Site Health and Safety Plan for all site personnel, including State personnel, that identifies potential health and safety hazards associated with each operation and specifies work practices that will be used to protect workers from those hazards in conformance with the DTSC and CAL-OSHA regulations. At a minimum, the Site Health and Safety Plan shall identify key site safety personnel, describe risks associated with the work, describe training requirements, describe appropriate personal protective equipment, describe any site-specific medical surveillance requirements, describe any periodic air monitoring requirements, define appropriate site work zones, and describe any decontamination requirements. The Site Health and Safety Plan shall be submitted at least 15 working days prior to beginning any excavation work for review and acceptance by the Engineer. Prior to submittal, the Contractor shall have the Site Health and Safety Plan approved by an Industrial Hygienist certified by the American Board of Industrial Hygiene. Subcontractors shall use the Site Health and Safety Plan prepared by the Contractor or prepare and submit a separate Site Health and Safety Plan in conformance with the provisions in this section.

SAFETY TRAINING

Prior to performing any work, all personnel, including State personnel, shall complete a safety training program that communicates the potential health and safety hazards associated with work on the site and instructs the personnel in procedures for doing the work safely. The level of training provided shall be consistent with the personnel's job function and conform to CAL-OSHA regulations. The training, including subsequent training required until completion of the project, shall be provided by the Contractor. The Contractor shall provide a certification of completion of the Safety Training Program to all personnel. Personal protective equipment required by State personnel to inspect the work shall be provided by the Contractor. The number of State personnel requiring the above mentioned safety training program and personal protective equipment will be 5.

PAYMENT

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work affected by this section and no additional compensation will be allowed therefor.

5-1.25 PHOTO IDENTIFICATION SYSTEM

Photo identification system shall consist of photo identification (ID) cards, production equipment and database. The Contractor shall submit a database record of every person contemplated to work on the project, including the employees of the subcontractors, vendor and suppliers.

All employees, including subcontractor, vendors and suppliers, shall have photo ID cards when reporting to work at the jobsite. Photo ID cards shall consist of a visible badge which shall be worn plainly visible at all times and a wallet-size card which shall be available for inspection as required. The front side of the badge shall contain a visible, identifiable photograph with a minimum size of 25mm x 25mm, the person's last name, first name, employee ID number, issue date, expiration date and employer logo. Wallet-size cards shall contain the last name, first name, middle initial, issue date, expiration date and issuer signature. Any lost badges or cards shall be immediately reported to the Engineer prior to being replaced. Individuals who do not possess the required photo ID cards shall be removed from the work site immediately at the Engineer's request.

Production equipment shall consist of system software, camera and duplex card printer. Equipment shall have the following standard features or equivalent, as determined by the Engineer:

A. System Software.-ID works production software will have the following standard features:

1. Microsoft Windows-compatible operation;
2. Full user audit log;
3. Administrator and user security;
4. BMP , .JPG , .PCX , .PNG, and .PSD image import formats;
5. BMP , .JPG , .PCX , .TGA , .TIF , .WMF image export formats;
6. Full character recognition search (alphabets, numbers) in all fields;
7. Automatic update of database after badge production;
8. Simultaneous batch print of multiple card formats;
9. Software license key;
10. Online Help and reference library; and
11. Documentation, installation, training and Help Desk support.

B. Camera.-The camera used for producing employee ID badges shall be USB digital with the following specifications:

1. Compatible with Windows 98, ME, 2000 Professional;
2. External AC power supply (auto-switch);
3. Operating Environment for humidity of 30%-90% and for temperature of 0-40° C;
4. Resolutions of 1600 x 1200, 1024 X 768, or 640 x 480 pixels;
5. Lens of 7.1 to 21.3 mm, F/1.8 to F/2.6 (equivalent to 40-120 mm lens on 35 mm camera);
6. Flash range appropriate for a subject 6 meters to 1.8 meters from camera; 6. 8 MB SmartMedia memory card; and
7. CE Mark, FCC Class B and UL approved.

In addition, the camera shall have the following features and components:

1. Datacard Integrated USB Digital Camera Software with controlled Auto-Crop or Manual ~p;
2. USB cable connection to PC;
3. High, Medium and Low resolution (customer selectable);
4. Built-in flash;
5. Automatic focus and exposure;
6. 3x Optical Zoom;
7. 2.11 Megapixel RGB CCD;
8. Country Specific Power Cords;
9. Power adapter (auto switches for the appropriate voltage);
10. Tripod, backdrop, frame and stand;
11. Installation instruction and manuals; and
12. Optional 3 meter USB Cable.

C. **Duplex Card Printer.**-The duplex card printer shall have the following features and specifications:

1. Windows 95, NT, 98, 2000 2000printer drivers;
2. CD ROM Tutorial;
3. Operator-replaceable printhead;
4. Audio and visual error prompts;
5. Operator messages displayed on PC screen;
6. Automatic card feed;
7. "True" exception card system;
8. Full-color or monochrome imaging;
9. One-step ribbon cartridge replacement;
10. Hands-free card cleaning system;
11. In-line topcoat application;
12. Portable, desktop design;
13. Input hopper holds 100- .76mm cards;
14. Output hopper holds 25- .76mm cards;
15. One-year depot warranty for printer;
16. One-year printhead warranty -no prorating, no card counting;
17. Continuous-tone, full-color, with alphanumeric text and logos print capability;
18. Background patterns with 300 dots per inch print resolution, In-line ribbon application of single topcoat capability , and dual voltage-auto sensing electrical requirements ;
19. 1 00/120V , 50/60 Hz and 220/240V, 50/60 Hz;
20. Parallel ECP mode or Compatible mode communications;
21. CR80-30 Plastic cards accepted;
21. PVC, with glossy overlamine laminate surface ID cards, 86mm x 54mm in size and 0.8mm in thickness;
22. Resident memory of2MB; and
23. UL, CSA, FCC Class A (for U.S. and Canada) approved.

A database record shall be furnished to the Engineer at least three days prior to beginning of work. It will be updated for new employees, subcontractors or suppliers daily and submitted weekly to the engineer. This database shall contain the following information:

- A. Caltrans contract number;
- B. Contractor/Subcontractor/Vendor/Supplier ID number;
- C. Employee ID number;
- D. Last name;
- E. First name;
- F. Middle name;
- G. Labor classification;
- H. Date of hire/employment date;
- I. Length of employment;
- J. Issue date; and
- K. Expiration date.

All data shall be delivered to the Engineer electronically, on Microsoft Windows compatible 3 1/2" floppy disks or CD ROM.s. The Contractor shall provide an updated personnel information whenever there is a change or at least five working days after requested by the I Engineer. The file format for all files delivered to the Engineer shall be standard comma delimited c (CSV), plain text files. Characteristics of this type of file are:

- A. All data is in the form of plain ASCII characters;
- B. Each row of data is delimited by a carriage return character: and
- C. Within row, each column (field) of data is delimited by a comma character.

Payment for providing photo identification system shall be included in the various items of work involved, and no separate payment will be made therefor.

In addition to photo identification system, access control measures shall be placed as directed by the Engineer. Access control measures will be paid for as extra work as provided for in Section 4-1.03D of the Standard Specifications, and will not be considered a special service as specified in Section 9-1.03D of the Standard Specifications.

5-1.26 ARCHAEOLOGICAL STUDY AREA

The Contractor's attention is directed to Archaeological Study Area (ASA) as shown on the plans. All construction activities within the ASA shall be performed in accordance with these special provisions and as directed by the Engineer.

No construction activities involving asphalt removal or earth disturbance and/or removal shall be allowed within the designated Environmentally Sensitive Area, ESA 1, which is adjacent to the boundaries of the Archaeological Study Area (ASA), as shown on the plans.

Attention is directed to "Hazardous Materials, General," "Hazardous Material Excavation," of these special provisions, regarding Hazardous Material Excavation.

The Contractor's attention is also directed to "Earthwork," of these special provisions, regarding roadway excavation and backfill within the area of ASA.

RESOURCE REGULATIONS AND MANDATES

In compliance with Section 106 of the National Historic Preservation Act of 1966, any archaeological resource discovered during construction activities must be evaluated by an Archaeologist. If a resource, such as an historic feature, consisting of a concentration of artifacts which may include ceramics, bottles, glass, bricks, or other human-made items over 50 years old, or a resource such as human bone are uncovered within the project limits, construction will be halted in the immediate area of the discovery until an evaluation is completed by the Archaeologist. A Native American monitor will be retained by the Engineer during archaeological studies within the ASA and if human skeletal remains are uncovered outside the ASA.

The California Public Resources Code (PRC) Sections 5097.00 and 5097.98 require protection of Native American remains which might be discovered and outlines procedures for handling any burials found. The California PRC Section 5097.9 and Health and Safety Code Section 7050 require coordination with the Native American Heritage Commission.

Under California PRC, Chapter 1.7, Section 5097.5, it is a misdemeanor charge for anyone to knowingly disturb a historical feature or steal an archaeological resource. The California Administrative Code, Title 14, Section 4307, mandates that no person shall disfigure any object of historical interest or value. Under California Penal Code, Title 14, Part 1, Section 622-1.2, it is a misdemeanor to destroy anything of historical value within any public place.

All archaeological resources located on State property are property of the State of California. All archaeological resources located on Federal property are property of the Federal government and are governed by federal environmental laws, such as, but not limited to, The Antiquities Act of 1906, The Archaeological Resources Protection Act, and the Native American Graves Protection and Resources Act.

CONSTRUCTION

The State will conduct an archaeological investigations of the soil from a depth of 0.45-m to 1.5-m, below the existing asphalt concrete pavement or the original ground, within the boundaries of the archeological study area, as shown on the plans and as specified in these special provisions.

The Contractor shall notify the Engineer in writing at least 15 working days, in advance of the beginning of removal of the top 0.45-m in depth of roadway excavation within the ASA in order to have the Archaeologist begin to mobilize for work in this area.

The trench excavation for the relocation of utility facilities, and drainage and sewer systems within the Area to be Monitored (ATM) as shown on plans shall be monitored by an Archaeologist

Archaeologists will work Monday through Friday. No weekend or overtime hours are anticipated and will only be approved by the Engineer in consultation with Project Archaeologist. The Contractor shall coordinate his/her work hours with the hours of the Archaeologists under direction of Project Archaeologist.

The Contractor shall provide construction equipment and operators, and/or laborers as determined by the Engineer, and shall cooperate with and assist Archeologists in their conducting of the archaeological work.

The Contractor shall provide, within 24 hours at the request of the Engineer:

- 1- A backhoe and operator. The backhoe shall be equipped with a 0.9-meter wide grading bucket with a flat blade and a front bucket for moving excavated material. Rubber tired backhoes may be used inside the ASA when approved of by the Engineer.
- 2- Suitable access/egress ramp or ladders or stairs into the ASA as directed by the Engineer.

The above equipment and material items, and operator required for the archaeological work as specified in these special provisions will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

The Contractor shall complete the removal of the first top 0.45-m roadway excavation within the ASA, in conformance with "Earthwork," of these special provisions.

It is anticipated that the archaeological investigations work will be completed within 15 working days, after removal of the first top 0.45-m of roadway excavation has been completed.

In the event that archaeological resources are discovered outside the designated ASA area, but within the project limits, and/or the ASA excavation is not ready for backfilling at the end of this 15 working day period, and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of such discoveries, the State will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

MEETINGS

The Contractor shall attend a pre-construction meeting to be held by the Engineer and the Project Archaeologist to discuss work within ASA, within 5 working days after the contract approval. In addition, the Contractor shall attend regular weekly meeting on site with the Engineer and the Project Archaeologist to discuss work progress in ASA.

5-1.27 ENVIRONMENTAL WORK RESTRICTIONS

The project is located within the jurisdictions of the U.S. Army Corp of Engineers (ACOE), the United States Coast Guard (USCG), the San Francisco Bay Conservation and Development Commission (BCDC), the California Department of Fish and Game (CDFG), the San Francisco Bay Regional Water Control Board (RWQCB), the U.S. Fish and Wildlife Service (USFWS). The Department has entered into agreements with these agencies regarding mitigation for potential impacts this project may have on biological resources and water quality.

Attention is directed to "Project Information," of these special provisions, regarding materials information handout for Regulation, Permits, Agreement, Consultation Letter, or Biological Opinion, and materials information available for inspection.

The Contractor's attention is directed to the existence of environmental work restrictions that require special precautions to be taken by the Contractor to protect the species listed below. It is the Contractor's responsibility to keep informed of all State and Federal Laws.

The Contractor's attention is also directed to the possibility that work operations will reveal paleontological resources. If the Contractor identifies such resources, the Engineer shall be notified and provided the find.

The Contractor shall comply with the California Endangered Species Act and the Federal Migratory Bird Treaty Act, which govern the protection of the American peregrine falcon, double-crested cormorant, western gull, and nesting birds found on Yerba Buena Island. The Department and qualified bird experts will monitor these birds during construction.

The Contractor shall notify the Engineer immediately if any dead or injured species of concern listed below are encountered.

The provisions in this section shall be made part of every subcontract executed pursuant to this contract.

The Contractor shall fully inform himself of the requirements of these permits, authorizations and agreements as well as all rules, regulations and conditions that may govern his operation in the following species of concern.

SPECIES OF CONCERN

AMERICAN PEREGRINE FALCON.-American peregrine falcon movements and behavior will be monitored by USFWS authorized personnel from the Santa Cruz Predatory Bird Research Group during construction between February 1 and July 31 of each year of construction. If American peregrine falcon nesting occurs on the falsework structures, the Contractor shall provide access to the nesting site as directed by the authorized biologist to monitor the nest site and to remove the falcon eggs and chicks.

DOUBLE-CRESTED CORMORANT, WESTERN GULLS, CALIFORNIA LEAST TERN AND CALIFORNIA BROWN PELICAN.-Where double-crested cormorant or western gull nests are present on the falsework structures, the Contractor shall not perform any activity within the nesting area during the breeding season defined as March 15 to August 31 of any year unless the Contractor implements the following:

- A. Remove existing nests from the work areas prior to the breeding season.
- B. Prevent the birds from completing nests in the work area by continually washing off nest material beginning March 1 through July 1.

Surveys and monitoring of the activities of the California least tern and California brown pelicans will be conducted by the State and others. The Contractor shall cooperate with the activities of the State monitors. If, through monitoring, it is determined that construction activities result in a taking of a least tern or brown pelican, the State and USFWS will work together to evaluate methods to eliminate further project-related impacts to these species. The Contractor will be informed of any changes in procedure that may affect their operations and may be entitled to compensation to extent provided under Section 8-1.09, "Right of Way Delays," of the Standard Specifications if operations are delayed.

BLACK-CROWNED NIGHT HERON, ALLEN'S HUMMINGBIRD, WHITE-TAILED KITE, BANK SWALLOW, AND BEWICK'S WREN.-Surveys and monitoring of the activities of these bird species will be conducted by the State and others. The Contractor shall cooperate with the activities of the State monitors. Upon results of the surveying and monitoring, the Engineer will notify the Contractor when removal of vegetation and trees on YBI can occur. Contractor may be entitled to some compensation to extent provided under Section 8-1.09, "Right of Way Delays," of the Standard Specifications if their operations are delayed.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefore.

5-1.28 ENVIRONMENTALLY SENSITIVE AREAS (GENERAL)

Attention is directed to the eight designated Environmentally Sensitive Areas (ESA), shown on the plans:

- A. ESA 1, Archeologically Sensitive Area.
Attention is directed to "Archaeological Study Area," of these special provisions.
- B- ESA 2, including the Senior Officers' Quarters Historic District and grounds, Quarters 8 and grounds, and Building No. 262.
- C. ESA 3, Quarters 10 and grounds, and Building No. 267 and grounds.
- D. ESA 4, Vegetation
- E. ESA 7, Tidal wetlands and eelgrass beds, located on the north side of YBI
- F. ESA 8, Eelgrass beds, located on the south sides of YBI

Water-based ESA boundaries will be marked with USCG-approved buoys, and will be established by others. No construction activities in-water within 200 meters of the ESA boundaries shall be allowed until the high visibility USCG-approved delineators have been installed.

Within the boundaries of land-based ESAs 1 through 4, and water-based ESAs 7 and 8, no project related activities shall take place, without the written approval from the Engineer. This specifically prohibits vehicle and barge access, storage or transport of any materials, including hydrocarbon and lead contaminated material, or any other project related activities. The Contractor shall take such measures, including the posting of written notices to his employees and subcontractors, to ensure that ESAs are not entered or disturbed.

Attention is directed to Archaeological ESA-1 of these special provisions. The Contractor shall comply with the requirements:

ARCHAEOLOGICAL ESA 1

Resource Regulations and Mandates

In compliance with Section 106 of the National Historic Preservation Act of 1966, any archaeological resource discovered during construction activities must be evaluated by the Department of Transportation Archaeologist.

The California Public Resources Code (PRC) Sections 5097.00 and 5097.98 require protection of Native American remains which might be discovered and outlines procedures for handling any burials found. The California PRC Section 5097.9 and Health and Safety Code Section 7050 require coordination with the Native American Heritage Commission.

Under California PRC, Chapter 1.7, Section 5097.5, it is a misdemeanor charge for anyone to knowingly disturb a historical feature or steal an archaeological resource. The California Administrative Code, Title 14, Section 4307, mandates that no person shall disfigure any object of historical interest or value. Under California Penal Code, Title 14, Part 1, Section 622-1.2, it is a misdemeanor to destroy anything of historical value within any public place.

All archaeological resources located on Department of Transportation property are property of the State of California. All archaeological resources located on Federal property are property of the Federal government and are governed by federal environmental laws, such as, but not limited to, the Antiquities Act of 1906, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.

Construction

No construction activities involving asphalt removal or earth disturbance and/or removal shall be allowed within the ESA 1 as shown on the plans. All other construction activities are permissible within this ESA, such as heavy equipment movement and storage and stock piling.

In the event that archaeological resources are discovered, within the contract limits, and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of such discoveries, the Department of Transportation will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

Should human skeletal material or other archaeological finds be uncovered, within the contract limits, the Contractor shall immediately notify the Engineer, and the Contractor's construction activities, within 10 meters of the find, shall be halted immediately and shall not be resumed until so permitted, in writing, by the Engineer.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefore.

5-1.29 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME

This project is located within the jurisdiction of the California Department of Fish and Game (CDFG). The Department of Transportation has received a California Endangered Species Act Incidental Take Permit from CDFG. The Contractor shall be fully informed of all rules, regulations and conditions of the permit that may govern the Contractor's operations in said area and shall conduct the Contractor's work accordingly. Said document shall be considered a part of, and shall become, an integral part of the special provisions and contract for this project.

Copies of the permits may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

The Contractor's attention is directed to Section "Environmental Work Restrictions" of these special provisions relating to specific protection measures required under this contract.

Any modifications to any agreement between the Department and the CDFG shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.30 RELATIONS WITH REGIONAL WATER QUALITY CONTROL BOARD

This project is located within the jurisdiction of the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). Permits have been issued covering work to be performed under this contract. The Contractor shall be fully informed of all rules, regulations and conditions that may govern the Contractor's operations in said area and shall conduct the Contractor's work accordingly. Said documents shall be considered a part of, and shall become, an integral part of the special provisions and contract for this project.

Copies of the permits may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

The Contractor's attention is directed to Sections 7-1.11, "Preservation of Property," and 7-1.12, "Indemnification and Insurance", of the Standard Specifications.

The Contractor's attention is also directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days during which the Contractor's operations are restricted in the floodway by the requirements of this section, shall be considered to be nonworking days if these restrictions cause a delay in the current controlling operation or operations.

Any modifications to the Order which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the RWQCB for their consideration. No additional time or compensation will be allowed for delays caused by the Contractor's proposed modifications to the Order.

When the Engineer notifies the Contractor that a modification to the Order is under consideration, no work will be allowed on the proposed modification until the Department of Transportation takes action on the proposed modification.

Any modifications to any agreement between the Department and the RWQCB shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.31 RELATIONS WITH U.S. ARMY CORPS OF ENGINEERS

This project is located within the jurisdiction of the United States Army Corps of Engineers (ACOE). A permit has been issued covering work to be performed under this contract. The Contractor shall be fully informed of all rules, regulations and conditions of the permit that may govern the Contractor's operations in said area and shall conduct the Contractor's work accordingly. Said document shall be considered a part of, and shall become, an integral part of the special provisions and contract for this project.

Copies of the permits may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

Any modifications to the permit which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the ACOE for their consideration. No additional time or compensation will be allowed for delays by the Contractor's proposed modifications to the agreement between the Department of Transportation and the ACOE.

When the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed on the proposed modification until the Department takes action on the proposed modification. Any modifications to any agreement between the Department and the ACOE shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.32 RELATIONS WITH SAN FRANCISCO BAY CONSERVATION DEVELOPMENT COMMISSION

This project is located within the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC). A permit has been issued covering work to be performed under this contract. The Contractor shall be fully informed of all rules, regulations and conditions of the permit that may govern the Contractor's operations in said areas as shown on the plan and shall conduct the Contractor's work accordingly. Said document shall be considered a part of, and shall become an integral part of the special provisions and contract for this project.

Copies of the permits may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

Any modifications to the permit, which are proposed by the Contractor, shall be submitted in writing to the Engineer for transmittal to the BCDC for their consideration. No additional time or compensation will be allowed for delays caused by the Contractor's proposed modifications to the agreement between the Department of Transportation and the BCDC.

If the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed on the proposed modification until the Department of Transportation takes action on the proposed modification. Any modifications to any agreement between the Department of Transportation and BCDC shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

For drainage systems to be located within the 100-foot shoreline band of BCDC's jurisdiction, the Contractor shall submit to the Engineer a plan within 15 working days after approval of the contract. The Engineer will submit to BCDC for final plan review; the Engineer and BCDC will review and the Engineer will provide comments to the Contractor within 50 calendar days. The Contractor will have 10 working days to revise and resubmit.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.33 RELATIONS WITH UNITED STATES COAST GUARD

This project is located at Yuba Buena Island, in the City and County of San Francisco, California is under the jurisdiction of the United States Coast Guard (USCG), Eleventh District.

A USCG Bridge Permit has been issued covering work to be performed under this contract. The Contractor shall be fully informed of all rules, regulations and conditions that may govern the Contractor's operations within the construction right-of-way and shall conduct the Contractor's work accordingly. The Bridge Permit shall be considered part of an integral part of the contract special provisions.

Copies of the Bridge Permit may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

The Contractor's attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.11, "Preservation of Property," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications, and to the section entitled "Sound Control Requirements" of these special provisions.

The Contractor shall comply with all requirements of the USCG with regard to the manner in which he conducts his operations and disposes of material. Any restriction of the channel and all navigation and warning lights shall be in accordance with regulations and subject to the approval of the USCG.

The Contractor's attention is directed to the following conditions which are among those established by the USCG in the work authorization for this project:

Nighttime Lighting.-The Contractor shall direct lighting on to the immediate area under construction and avoid shining lights towards residences on YBI and marine traffic. The Contractor shall also not shine lights into the water at night.

The Contractor shall be aware of the USCG facility on the southeast side of Yerba Buena Island. The Contractor's activities shall not interfere with the twenty-four hour a day operation at the USCG facility. The Contractor shall not restrict land or sea access to that facility.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days during which the Contractor's operations are restricted in the navigation channel by others shall be considered to be nonworking days if, in the opinion of the Engineer, these restrictions cause a delay in the current controlling operation or operations.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.34 RELATIONS WITH UNITED STATES FISH AND WILDLIFE SERVICE

This project is located within the jurisdiction of the United States Fish and Wildlife Service (USFWS). The USFWS has issued a Biological Opinion regarding several species which are protected under both the Federal Endangered Species Act and the California Endangered Species Act. The specifics of this opinion are part of an agreement which the Department of Transportation has entered into with the USFWS. The Contractor shall be fully informed of the requirements of this agreement as well as of all rules, regulations, and conditions that may govern the Contractor's operations in said area and shall conduct the Contractor's operations accordingly. Said document shall be considered a part of, and shall become, an integral part of the special provisions and contract for this project.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

Attention is directed to "Environmental Work Restrictions" of these special provisions relating to specific measures required under this contract.

Any modifications to any agreement between the Department and the USFWS shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.35 RELATIONS WITH NATIONAL MARINE FISHERIES SERVICES

This project is located within the jurisdiction of the National Marine Fisheries Service (NMFS). The NMFS has concurred with measures developed by the Department regarding the protection of winter-run Chinook salmon habitat and critical habitat for steelhead trout, and for protection of the local California Sea Lion and Harbor Seal populations, and gray whale. The Contractor shall be fully informed of the requirements associated with these measures as well as all rules, regulations and conditions that may govern the Contractor's operations in said area and shall conduct their operations accordingly. Said document shall be considered a part of, and shall become, an integral part of the special provisions and contract for this project.

Attention is directed to Section "Environmental Work Restrictions" of these special provisions relating to specific measures required under this contract.

The Contractor shall restrict contract vessels from entering a no entry buffer zone of 500 meters (1,640 feet) radius measured from the harbor seal haul-out site to the southwest of Yerba Buena Island.

The NMFS has prepared advisory letters to the Department, in response to the Department's request for consultation regarding species of fish and marine mammals that may be affected by construction activities. The Contractor shall be fully informed of and abide by the recommendations of the NMFS in performing the Contractor's operations on this project.

Copies of these consultation letters may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov.

Any modifications to any agreement between the Department and the NMFS shall be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the United States Standard Measures which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use, the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details, the Contractor shall submit plans and working drawings in conformance with the provisions in , "Working Drawings," of these special provisions.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL FASTENERS
ASTM Designation: A 325M

METRIC SIZE SHOWN ON THE PLANS mm x thread pitch	SIZE TO BE SUBSTITUTED inch
M16 x 2	5/8
M20 x 2.5	3/4
M22 x 2.5	7/8
M24 x 3	1
M27 x 3	1-1/8
M30 x 3.5	1-1/4
M36 x 4	1-1/2

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT
ASTM Designation: A 82

METRIC SIZE SHOWN ON THE PLANS ² mm	SIZE TO BE SUBSTITUTED ² inch x 100
MW9	W1.4
MW10	W1.6
MW13	W2.0
MW15	W2.3
MW19	W2.9
MW20	W3.1
MW22	W3.5
MW25	W3.9, except W3.5 in piles only
MW26	W4.0
MW30	W4.7
MW32	W5.0
MW35	W5.4
MW40	W6.2
MW45	W6.5
MW50	W7.8
MW55	W8.5, except W8.0 in piles only
MW60	W9.3
MW70	W10.9, except W11.0 in piles only
MW80	W12.4
MW90	W14.0
MW100	W15.5

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

METRIC BAR DESIGNATION NUMBER ¹ SHOWN ON THE PLANS	BAR DESIGNATION NUMBER ² TO BE SUBSTITUTED
10	3
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

¹Bar designation numbers approximate the number of millimeters of the nominal diameter of the bars.

²Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

SUBSTITUTION TABLE FOR SIZES OF:

(1) STEEL FASTENERS FOR GENERAL APPLICATIONS (ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55), and

(2) HIGH STRENGTH STEEL FASTENERS (ASTM Designation: A 325 or A 449)

METRIC SIZE SHOWN ON THE PLANS mm	SIZE TO BE SUBSTITUTED inch
6 or 6.35	1/4
8 or 7.94	5/16
10 or 9.52	3/8
11 or 11.11	7/16
13 or 12.70	1/2
14 or 14.29	9/16
16 or 15.88	5/8
19 or 19.05	3/4
22 or 22.22	7/8
24, 25, or 25.40	1
29 or 28.58	1-1/8
32 or 31.75	1-1/4
35 or 34.93	1-3/8
38 or 38.10	1-1/2
44 or 44.45	1-3/4
51 or 50.80	2
57 or 57.15	2-1/4
64 or 63.50	2-1/2
70 or 69.85	2-3/4
76 or 76.20	3
83 or 82.55	3-1/4
89 or 88.90	3-1/2
95 or 95.25	3-3/4
102 or 101.60	4

SUBSTITUTION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

UNCOATED HOT AND COLD ROLLED SHEETS		HOT-DIPPED ZINC COATED SHEETS (GALVANIZED)	
METRIC THICKNESS SHOWN ON THE PLANS mm	GAGE TO BE SUBSTITUTED inch	METRIC THICKNESS SHOWN ON THE PLANS mm	GAGE TO BE SUBSTITUTED inch
7.94	0.3125	4.270	0.1681
6.07	0.2391	3.891	0.1532
5.69	0.2242	3.510	0.1382
5.31	0.2092	3.132	0.1233
4.94	0.1943	2.753	0.1084
4.55	0.1793	2.372	0.0934
4.18	0.1644	1.994	0.0785
3.80	0.1495	1.803	0.0710
3.42	0.1345	1.613	0.0635
3.04	0.1196	1.461	0.0575
2.66	0.1046	1.311	0.0516
2.28	0.0897	1.158	0.0456
1.90	0.0747	1.006 or 1.016	0.0396
1.71	0.0673	0.930	0.0366
1.52	0.0598	0.853	0.0336
1.37	0.0538	0.777	0.0306
1.21	0.0478	0.701	0.0276
1.06	0.0418	0.627	0.0247
0.91	0.0359	0.551	0.0217
0.84	0.0329	0.513	0.0202
0.76	0.0299	0.475	0.0187
0.68	0.0269	-----	-----
0.61	0.0239	-----	-----
0.53	0.0209	-----	-----
0.45	0.0179	-----	-----
0.42	0.0164	-----	-----
0.38	0.0149	-----	-----

SUBSTITUTION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	WIRE THICKNESS TO BE SUBSTITUTED inch	GAGE NO.
6.20	0.244	3
5.72	0.225	4
5.26	0.207	5
4.88	0.192	6
4.50	0.177	7
4.11	0.162	8
3.76	0.148	9
3.43	0.135	10
3.05	0.120	11
2.69	0.106	12
2.34	0.092	13
2.03	0.080	14
1.83	0.072	15
1.57	0.062	16
1.37	0.054	17
1.22	0.048	18
1.04	0.041	19
0.89	0.035	20

SUBSTITUTION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	SIZE TO BE SUBSTITUTED inch x inch
PP 360 x 4.55	NPS 14 x 0.179
PP 360 x 6.35	NPS 14 x 0.250
PP 360 x 9.53	NPS 14 x 0.375
PP 360 x 11.12	NPS 14 x 0.438
PP 406 x 12.70	NPS 16 x 0.500
PP 460 x T	NPS 18 x T"
PP 508 x T	NPS 20 x T"
PP 559 x T	NPS 22 x T"
PP 610 x T	NPS 24 x T"
PP 660 x T	NPS 26 x T"
PP 711 x T	NPS 28 x T"
PP 762 x T	NPS 30 x T"
PP 813 x T	NPS 32 x T"
PP 864 x T	NPS 34 x T"
PP 914 x T	NPS 36 x T"
PP 965 x T	NPS 38 x T"
PP 1016 x T	NPS 40 x T"
PP 1067 x T	NPS 42 x T"
PP 1118 x T	NPS 44 x T"
PP 1219 x T	NPS 48 x T"
PP 1524 x T	NPS 60 x T"

The thickness in millimeters (T) represents an exact conversion of the thickness in inches (T").

SUBSTITUTION TABLE FOR STRUCTURAL TIMBER AND LUMBER

METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm	METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm	NOMINAL SIZE TO BE SUBSTITUTED inch x inch
19x89	20x90	1x4
38x89	40x90	2x4
64x89	65x90	3x4
89x89	90x90	4x4
140x140	143x143	6x6
140x184	143x190	6x8
184x184	190x190	8x8
235x235	241x241	10x10
286x286	292x292	12x12

SUBSTITUTION TABLE FOR NAILS AND SPIKES

METRIC COMMON NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC BOX NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC SPIKE, SHOWN ON THE PLANS Length, mm Diameter, mm	SIZE TO BE SUBSTITUTED Penny-weight
50.80 2.87	50.80 2.51	————	6d
63.50 3.33	63.50 2.87	————	8d
76.20 3.76	76.20 3.25	76.20 4.88	10d
82.55 3.76	82.55 3.25	82.55 4.88	12d
88.90 4.11	88.90 3.43	88.90 5.26	16d
101.60 4.88	101.60 3.76	101.60 5.72	20d
114.30 5.26	114.30 3.76	114.30 6.20	30d
127.00 5.72	127.00 4.11	127.00 6.68	40d
————	————	139.70 7.19	50d
————	————	152.40 7.19	60d

SUBSTITUTION TABLE FOR IRRIGATION
COMPONENTS

METRIC WATER METERS, TRUCK LOADING STANDPIPES, VALVES, BACKFLOW PREVENTERS, FLOW SENSORS, WYE STRAINERS, FILTER ASSEMBLY UNITS, PIPE SUPPLY LINES, AND PIPE IRRIGATION SUPPLY LINES SHOWN ON THE PLANS DIAMETER NOMINAL (DN) mm	NOMINAL SIZE TO BE SUBSTITUTED inch
15	1/2
20	3/4
25	1
32	1-1/4
40	1-1/2
50	2
65	2-1/2
75	3
100	4
150	6
200	8
250	10
300	12
350	14
400	16

Unless otherwise specified, substitutions of United States Standard Measures standard structural shapes corresponding to the metric designations shown on the plans and in conformance with the requirements in ASTM Designation: A 6/A 6M, Annex 2, will be allowed.

8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains the following list of Prequalified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

For those categories of materials included on the list of Prequalified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included on the list of Prequalified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Standard Specifications.

Materials and products may be added to the list of Prequalified and Tested Signing and Delineation Materials if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

**PAVEMENT MARKERS, PERMANENT TYPE
Retroreflective With Abrasion Resistant Surface (ARS)**

- A. Apex, Model 921AR (100 mm x 100 mm)

- B. Avery Dennison (formerly Stimsonite), Models C88 (100 mm x 100 mm), 911 (100 mm x 100 mm) and 953 (70 mm x 114 mm)
- C. Ray-O-Lite, Model "AA" ARS (100 mm x 100 mm)
- D. 3M Series 290 (89 mm x 100 mm)
- E. 3M Series 290 PSA, with pressure sensitive adhesive pad (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(for recessed applications only)

- A. Avery Dennison (formerly Stimsonite), Model 948 (58 mm x 119 mm)
 - B. Avery Dennison (formerly Stimsonite), Model 944SB (51 mm x 100 mm)*
 - C. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
 - D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*
- *For use only in 114 mm wide (older) recessed slots

Non-Reflective, 100 mm Round

- A. Alpine Products, "D-Dot" and "ANR" (ABS)
- B. Apex Universal (Ceramic)
- C. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
- D. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
- E. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- F. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- G. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
- H. Novabrite Models Adot-w (White) Adot-y (Yellow), (ABS)
- I. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
- J. Road Creations, Model RCB4NR (Acrylic)
- K. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)
- L. Zumar Industries, "Titan TM40A" (ABS)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)

- A. Apex Universal, Model 924 (100 mm x 100 mm)
- B. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
- C. Road Creations, Model R41C (100 mm x 100 mm)
- D. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

Temporary Markers For Short Term Day/Night Use (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Bunzl Extrusion, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Brite-Line, "DeltaLine XRP"
- D. Swarco Industries, "Director 35" (For transverse application only)
- E. Swarco Industries, "Director 60"
- F. 3M, "Stamark" Series 380 and 5730
- G. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)

- A. Advanced Traffic Marking, Series 200
- B. Brite-Line, Series 100
- C. Garlock Rubber Technologies, Series 2000
- D. P.B. Laminations, Aztec, Grade 102

- E. Swarco Industries, "Director-2"
- F. Trelleborg Industri, R140 Series
- G. 3M, Series 620 "CR", and Series A750
- H. 3M, Series A145, Removable Black Line Mask
(Black Tape: for use only on Asphalt Concrete Surfaces)
- I. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: for use only on Asphalt Concrete Surfaces)
- J. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Asphalt Concrete Surfaces)
- K. Trelleborg Industri, RB-140
(Black Tape: for use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

- A. Avery Dennison, "Hotape"
- B. Flint Trading, "Premark," "Premark 20/20 Flex," and "Premark 20/20 Flex Plus"

Ceramic Surfacing Laminate, 150 mm x 150 mm

- A. Safeline Industries/Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

- A. Bunzl Extrusion, "Flexi-Guide Models 400 and 566"
- B. Carsonite, Curve-Flex CFRM-400
- C. Carsonite, Roadmarker CRM-375
- D. FlexStake, Model 654 TM
- E. GreenLine Models HWD1-66 and CGD1-66
- F. J. Miller Industries, Model JMI-375 (with soil anchor)

Special Use Type, 1700 mm

- A. Bunzl Extrusion, Model FG 560 (with 450 mm U-Channel base)
- B. Carsonite, "Survivor" (with 450 mm U-Channel base)
- C. Carsonite, Roadmarker CRM-375 (with 450 mm U-Channel base)
- D. FlexStake, Model 604
- E. GreenLine Models HWDU and CGD (with 450 mm U-Channel base)
- F. Impact Recovery Model D36, with #105 Driveable Base
- G. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- H. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Type, 1200 mm

- A. Bent Manufacturing Company, Masterflex Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754 TM
- D. Impact Recovery Model D48, with #101 Fixed (Surface-Mount) Base
- E. Three D Traffic Works "Channelflex" Part No. 522248W

CHANNELIZERS

Surface Mount Type, 900 mm

- A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Bunzl Extrusion, Flexi-Guide Models FG300LD and FG300UR
- C. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- D. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- E. FlexStake, Surface Mount, Models 703 and 753 TM
- F. GreenLine, Model SMD-36
- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
- I. Repo, Models 300 and 400

- J. Safe-Hit, Guide Post, Model SH236SMA
- K. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
- L. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
- M. Three D Traffic Works "Channelflex" Part No. 522053W

Lane Separation System

- A. Bunzl "Flexi-Guide (FG) 300 Curb System"
- B. Qwick Kurb, "Klemmfix Guide System"
- C. Recycled Technology, Inc. "Safe-Lane System"

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Radiator Specialty Company "Enforcer"
- D. Roadmaker Company "Stacker"
- E. TrafFix Devices "Grabber"

OBJECT MARKERS

Type "K", 450 mm

- A. Bunzl, Model FG318PE
- B. Carsonite, Model SMD 615
- C. FlexStake, Model 701 KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Model SH718SMA
- F. The Line Connection, Model DP21-4K

Type "K-4" / "Q" Object Markers, 600 mm

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Bunzl Extrusion, Model FG324PE
- C. Carsonite, Super Duck II
- D. FlexStake, Model 701KM
- E. Repo, Models 300 and 400
- F. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
- G. The Line Connection, Model DP21-4Q
- H. Three D Traffic Works "Q" Marker, Part No. 531702W

**CONCRETE BARRIER MARKERS AND
TEMPORARY RAILING (TYPE K) REFLECTORS**

Impactable Type

- A. ARTUK, "FB"
- B. Bunzl Extrusion, Models PCBM-12 and PCBM-T12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100
- E. Plastic Safety Systems "BAM" Models OM-BARR and OM-BWAR
- F. Sun-Lab Technology, "Safety Guide Light Model TM-5"
- G. Three D Traffic Works "Roadguide" TD9000 Series

Non-Impactable Type

- A. ARTUK, JD Series
- B. Plastic Safety Systems "BAM" Models OM-BITARW and OM-BITARA
- C. Vega Molded Products, Models GBM and JD

THREE BEAM BARRIER MARKERS

(For use to the left of traffic)

- A. Bunzl Extrusion, "Mini" (75 mm x 254 mm)

- B. Duraflex Corp., "Railrider"

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic)

- A. Bunzl Extrusion, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM
- C. Sun-Lab Technology, "Safety Guide Light, Model TM16," (75 mm x 300 mm)
- D. Three D Traffic Works "Roadguide" TD9416 Series

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied vertically. Place top of 75 mm x 300 mm reflective element at 1200 mm above roadway)

- A. Bunzl Extrusion, PCBM S-36
- B. Sun-Lab Technology, "Safety Guide Light, Model SM12," (75 mm x 300 mm)

GUARD RAILING DELINEATOR

(Place top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

- A. Bunzl Extrusion, FG 427 and FG 527
- B. Carsonite, Model 427
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. J. Miller Model JMI-375G
- F. Safe-Hit, Model SH227GRD
- G. Three D Traffic Works "Guardflex" TD5100 Series

Steel Post Type

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

- A. Avery Dennison T-6500 Series (Formerly Stimsonite, Series 6200) (For rigid substrate devices only)
- B. Avery Dennison WR-6100 Series
- C. Nippon Carbide, Flexible Ultralite Grade (ULG) II
- D. Reflexite, PC-1000 Metalized Polycarbonate
- E. Reflexite, AC-1000 Acrylic
- F. Reflexite, AP-1000 Metalized Polyester
- G. Reflexite, Conformalight, AR-1000 Abrasion Resistant Coating
- H. 3M, High Intensity

Traffic Cones, 330 mm Sleeves

- A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

Traffic Cones, 100 mm and 150 mm Sleeves

- A. Nippon Carbide, Flexible Ultralite Grade (ULG) II
- B. Reflexite, Vinyl, "TR" (Semi-transparent) or "Conformalight"
- C. 3M Series 3840

Barrels and Drums

- A. Avery Dennison WR-6100
- B. Nippon Carbide, Flexible Ultralite Grade (ULG) II
- C. Reflexite, "Conformalight", "Super High Intensity" or "High Impact Drum Sheeting"
- D. 3M Series 3810

Barricades: Type I, Medium-Intensity (Typically Enclosed Lens, Glass-Bead Element)

- A. American Decal, Adcolite
- B. Avery Dennison, T-1500 and T-1600 series
- C. 3M Engineer Grade, Series 3170

Barricades: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)

- A. Avery Dennison, T-2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

Signs: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)

- A. Avery Dennison, T-2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

Signs: Type III, High-Intensity (Typically Encapsulated Glass-Bead Element)

- A. Avery Dennison, T-5500 Series
- B. Nippon Carbide, Nikkalite Brand Ultralite Grade II
- C. 3M Series 3870

Signs: Type IV, High-Intensity (Typically Unmetallized Microprismatic Element)

- A. Avery Dennison, T-6500 Series (Formerly Stimsonite Series 6200)
- B. Nippon Carbide, Crystal Grade, 94000 Series

Signs: Type VI, Elastomeric (Roll-Up) High-Intensity, without Adhesive

- A. Avery Dennison, WU-6014 (Fluorescent orange)
- B. Novabrite LLC, "Econobrite"
- B. Reflexite "Vinyl" (Orange)
- C. Reflexite "SuperBright" (Fluorescent orange)
- D. Reflexite "Marathon" (Fluorescent orange)
- E. 3M Series RS34 (Orange) and RS20 (Fluorescent orange)

Signs: Type VII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)

- A. 3M LDP Series 3970

Signs: Type VIII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)

- A. Avery Dennison, T-7500 Series

Signs: Type IX, Very-High-Intensity (Typically Unmetallized Microprismatic Element)

- A. 3M VIP Series 3990 Diamond Grade

SPECIALTY SIGNS

- A. All Sign Products, STOP Sign (All Plastic), 750 mm
- B. Relexite "Endurance" Work Zone Sign (with Semi-Rigid Plastic Substrate)

SIGN SUBSTRATE

Fiberglass Reinforced Plastic (FRP)

- A. Fiber-Brite
- B. Sequentia, "Polyplate"
- C. Inteplast Group "InteCel" (13 mm for Post-Mounted CZ Signs, 1200 mm or less)

Aluminum Composite

- A. Alcan Composites "Dibond Material, 2 mm"
- B. Mitsubishi Chemical America, Alpolite 350

8-1.03 STATE-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Materials," of the Standard Specifications and these special provisions.

The following materials will be furnished to the Contractor:

- A. Sign panels for roadside.
- B. Padlocks for walk gates.
- C. Fire Hydrants

The Contractor shall notify the Engineer not less than 48 hours before State-furnished material is to be picked up by the Contractor. A full description of the material and the time the material will be picked up shall be provided with notification.

8-1.04 ENGINEERING FABRICS

Engineering fabrics shall conform to the provisions in Section 88, "Engineering Fabrics," of the Standard Specifications.

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

References to Section 90-2.01, "Portland Cement," of the Standard Specifications shall mean Section 90-2.01, "Cement," of the Standard Specifications.

Mineral admixture shall be combined with cement in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications for the concrete materials specified in Section 56-2, "Roadside Signs," of the Standard Specifications.

The requirements of Section 90-4.08, "Required Use of Mineral Admixture," of the Standard Specifications shall not apply to Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications.

The Department maintains a list of sources of fine and coarse aggregate that have been approved for use with a reduced amount of mineral admixture in the total amount of cementitious material to be used. A source of aggregate will be considered for addition to the approved list if the producer of the aggregate submits to the Transportation Laboratory certified test results from a qualified testing laboratory that verify the aggregate complies with the requirements. Prior to starting the testing, the aggregate test shall be registered with the Department. A registration number can be obtained by calling (916) 227-7228. The registration number shall be used as the identification for the aggregate sample in correspondence with the Department. Upon request, a split of the tested sample shall be provided to the Department. Approval of aggregate will depend upon compliance with the specifications, based on the certified test results submitted, together with any replicate testing the Department may elect to perform. Approval will expire 3 years from the date the most recent registered and evaluated sample was collected from the aggregate source.

Qualified testing laboratories shall conform to the following requirements:

- A. Laboratories performing ASTM Designation: C 1293 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Concrete Proficiency Sample Program and shall have received a score of 3 or better on all tests of the previous 2 sets of concrete samples.
- B. Laboratories performing ASTM Designation: C 1260 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Pozzolan Proficiency Sample Program and shall have received a score of 3 or better on the shrinkage and soundness tests of the previous 2 sets of pozzolan samples.

Aggregates on the list shall conform to one of the following requirements:

- A. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1293, the average expansion at one year shall be less than or equal to 0.040 percent; or
- B. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1260, the average of the expansion at 16 days shall be less than or equal to 0.15 percent.

The amounts of cement and mineral admixture used in cementitious material shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications and shall conform to the following:

- A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.
- B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
 - 1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
 - 2. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass, and any of the aggregates used are not listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
 - 3. When the calcium oxide content of a mineral admixture is greater than 2 percent by mass and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
 - 4. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.
 - 5. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," of the Standard Specifications is used and the fine and coarse aggregates are listed on the approved list as specified in these special provisions, then the amount of mineral admixture shall not be less than 7 percent by mass of the total amount of cementitious material to be used in the mix.
- C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," of the Standard Specifications specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

SECTION 8-3. WELDING

8-3.01 WELDING

GENERAL

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform welding for this project.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans, or in these special provisions, the year of adoption for these codes shall be as listed:

AWS Code	Year of Adoption
D1.1	2000
D1.4	1998
D1.5	1995
D1.5 (metric only)	1996

Requirements of the AWS welding codes shall apply unless specified otherwise in the Standard Specifications, on the plans, or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or ANSI/AASHTO/AWS.

Sections 6.1.2 through 6.1.4.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing of each weld joint prior to welding, during welding, and after welding as specified in this section and as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The QC Inspector shall be the duly designated person who acts for and on behalf of the Contractor for inspection, testing, and quality related matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

The QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as an AWS Certified Welding Inspector (CWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Section 6.14.6, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4, and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are replaced with the following:

Personnel performing nondestructive testing (NDT) shall be qualified and certified in conformance with the requirements of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Only individuals who are 1) certified as an NDT Level II, or 2) Level III technicians who hold a current ASNT Level III certificate in that discipline and are authorized and certified to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are replaced with the following:

The QC Inspector shall inspect and approve each joint preparation, assembly practice, welding technique, and the performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved welding procedure specification (WPS) are met.

Section 6.5.4 of AWS D 1.5 is replaced with the following:

The QC Inspector shall inspect and approve each joint preparation, assembly practice, welding technique, and the performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of Sections 3 and 9.21. The size and contour of all welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS welding codes, in the Standard Specifications, or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work but shall be at the Contractor's expense.

Required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means.

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present on the shop floor or project site when any welding operation is being performed, and (2) having a QC Inspector within such close proximity of all welding operations so that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of all joint preparations, assembly practices, welding techniques, and the performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed. The QC Inspector shall confirm and document compliance with the requirements of the AWS code

criteria and the requirements of these special provisions on all weld joints before welding, during welding, and after the completion of each weld.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

WELDING QUALITY CONTROL

Welding quality control shall conform to the requirements in the AWS welding codes, the Standard Specifications, and these special provisions.

Unless otherwise specified, welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," Section 56-1, "Overhead Sign Structures," Section 75-1.035, "Bridge Joint Restrainer Units," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

The welding of fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

The Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of welding, including materials and workmanship, performed by the Contractor and subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, and approving all correspondence, required submittals, and reports to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

Welding inspection personnel or NDT firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for the following conditions:

- A. The welding is performed at a permanent fabrication or manufacturing facility which is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.
- B. The welding is performed at a permanent fabrication or manufacturing facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures. This condition shall apply only for work welded in conformance with the provisions in Section 56-1, "Overhead Sign Structures" or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.
- C. The welding is performed on pipe pile material at a permanent pipe manufacturing facility where an automatic welding process or seamless pipe operation is used in conformance with the requirements in the applicable welding code as specified elsewhere in these special provisions.

For welding performed at such facilities, the inspection personnel or NDT firms may be employed or compensated by the facility performing the welding.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a pre-welding meeting between the Engineer, Contractor, and any entity performing welding for this project, shall be held to discuss the requirements for the WQCP.

The Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each item of work for which welding is to be performed.

The Contractor shall allow the Engineer 2 weeks to review the WQCP submittal after a complete plan has been received. Except for work that is welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and for pipe piling produced at a permanent manufacturing facility as specified above, no welding shall be performed until the WQCP is approved in writing by the Engineer. Materials welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and pipe piling produced at such permanent manufacturing facilities, shall not be incorporated into the work until the WQCP is approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer,

completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or any addendum to the approved WQCP shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for revisions to the WQCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC, or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended WQCP or addendum. Work affected by the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Each WQCP shall include the applicable portions of the following, as determined by the Engineer:

- A. The name of the welding firm and any required NDT inspection personnel or firms.
- B. A manual prepared by the NDT inspection personnel or firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT inspection personnel or firm, and the names, qualifications, and documentation of certifications for all personnel to be used.
- C. The name of the QCM and the names, qualifications, and documentation of certifications for all QC Inspectors and Assistant QC Inspectors to be used.
- D. An organizational chart showing all QC personnel and their assigned QC responsibilities.
- E. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
 1. all visual inspections.
 2. all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports.
 3. calibration procedures and calibration frequency for all NDT equipment.
- F. A system for the identification and tracking of all welds, NDT, and any required repairs, and a procedure for the reinspection of repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld, 2) placing all identification and tracking information on each radiograph, 3) a method of reporting nonconforming welds to the Engineer, and 4) a method of documentation of repairs and reinspection of nonconforming welds.
- G. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size.
- H. The WPS, including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness.
- I. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness.
- J. One authorized copy or original code book for each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.
- K. Forms to be used for Certificates of Compliance, daily production logs, and daily reports.

After final approval of the WQCP, amended WQCP, or addendum, the Contractor shall submit 7 copies to the Engineer of the approved documents.

It is expressly understood that the Engineer's approval of the Contractor's WQCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformance with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any requirement of the plans and specifications nor relieve the Contractor of any obligation thereunder; and defective work, materials, and equipment may be rejected notwithstanding approval of the WQCP.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, except partial penetration longitudinal seam welds performed in conformance

with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications. The log shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each QC Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding. For work welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, and for piling produced at a permanent manufacturing facility, the following items shall be included in a Welding Report that is to be submitted to the Engineer 48 hours prior to furnishing a Certificate of Compliance for the material:

- A. Reports of all visual weld inspections and NDT.
- B. Radiographs and radiographic reports, and other required NDT reports.
- C. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests and corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable.
- D. Daily production log.

Radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the WQCP. In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the WQCP.

Reports regarding NDT, including radiographs, shall be signed by both the NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Unless otherwise specified, the Engineer shall be allowed 7 working days to review the report and respond in writing after a complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover welds pending notification by the Engineer, and in the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, the Engineer shall be notified immediately in writing when welding problems, deficiencies, base metal repairs, or any other type of repairs not submitted in the WQCP are discovered and also of the proposed repair procedures to correct them. The Contractor shall allow the Engineer one week to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in conformance with the details shown on the plans, the Standard Specifications, and these special provisions.

PAYMENT

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

SECTION 9. (BLANK)

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages," of these special provisions.

Attention is directed to the Contractor's access to and from the project site which may be limited by the closure of eastbound off-ramp (Right), westbound off-ramp connector to Hillcrest Rd. and Southgate Rd., under Contract 04-0120R4.

The order of work for the electrical installation shall be as described as shown on E-1 of the electrical plans.

Furthermore, the Contractor as a first order of work shall place the order for the electrical engineered and miscellaneous equipment, conduits and consumable materials. The Engineer shall be furnished a statement from the vendor that the order for the said systems has been received and accepted by the vendor.

No electrical work shall be performed on any system within the project site until all Contractor-furnished electrical materials for that individual system have been tested and delivered to Contractor.

10-1.02 TEMPORARY DRAINAGE INLET PROTECTION

Temporary drainage inlet protection for existing and new drainage inlets shall be installed, maintained and later removed as shown on the plans, as specified in these special provisions, and as directed by the Engineer. There are approximately 12 existing drainage inlets within the limits of work.

Temporary drainage inlet protection shall be enforced year round. The plans provide temporary protection for stormwater runoff. The Contractor shall be responsible for providing temporary storm drain inlet protection during all phases of construction. The protection used shall be appropriate to control and prevent discharges of material generated from the ongoing adjacent construction activity.

The Contractor shall select the appropriate drainage inlet protection shown on the plans to meet the field condition around the drainage inlet. For all other drainage inlets within the project limits that do not conform to the details shown on the plans, the Contractor shall submit to the Engineer for approval, provisions for providing temporary drainage inlet protection.

Special attention shall be given to existing and new drainage inlets adjacent to traffic. The Engineer shall review the need for drainage inlet protection at each location. Each proposed drainage inlet protection shall be approved by the Engineer to ensure safety.

Temporary drainage inlet protection Types 2A and 4 shall have a continuous physical barrier separating the drainage inlet from traffic. Temporary drainage inlet protection Types 2B and 3 do not require a barrier installed between the drainage inlet and traffic.

Throughout the duration of the contract, the Contractor shall provide temporary drainage inlet protection to meet with the changing condition of the drainage inlet.

Some conditions may require combining materials outlined in the special provision to address conditions that cannot be anticipated in advance. The Contractor shall submit temporary drainage inlet protection drawings for such cases to the Engineer for approval prior to installation.

The Contractor shall use temporary drainage inlet protection as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall graphically show the use of temporary drainage inlet protection in relation to other water pollution control work specified elsewhere in these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

A. ROCK BAG.—Rock bag fabric shall be non-woven polypropylene, with a minimum unit weight of 250g/m². The fabric shall have a mullen burst strength of at least 2500 kPa, per ASTM Designation D3786 and an ultraviolet (UV) stability exceeding 70 percent at 500 hours. Rock bags shall have a length of 600 mm to 800 mm, width of 400 mm to 500 mm, thickness of 150 mm to 200 mm, and shall be filled to a weighted mass ranging from 13 kg to 22 kg. Rock bag shall fill material shall be non-cohesive, gravel, free from deleterious material. After filling, the opening shall be secured such that rock shall not escape from the bag.

B. TEMPORARY FLEXIBLE DIKE.—Temporary flexible dike fabric cover and skirt shall be a woven polypropylene fabric with a minimum tensile strength of 0.44-kN, conforming to ASTM Designation: D 4632. The

prefabricated fabric shall be high visibility orange in color that is integral to the fabric; painting shall not be allowed. The fabric shall have an ultraviolet (UV) stability exceeding 70 percent.

Temporary flexible dike inner material shall be urethane foam and shall be shaped and dimensioned as shown on the plans.

Adhesive for temporary flexible dike shall be a solvent free rubber modified asphalt emulsion. The color of the emulsion shall be brown when wet and shall have a drying period of not more than 3 hours.

Anchoring nails for temporary flexible dike shall be capable of penetrating concrete and asphalt surfaces.

C. SEDIMENT BAG.—Sedimentation control fabric for sediment bags shall be a prefabricated sedimentation control fabric envelop with a woven polypropylene fabric and sewn with a double stitched seam using nylon thread. The fabric shall have a grab tensile strength of at least 120 kg and grab elongation of 20 percent, per ASTM Designation: D4632. The fabric shall have a mullen burst strength of at least 2895 kPa, per ASTM Designation: D3786 and an ultraviolet (UV) stability exceeding 90 percent. The sedimentation control fabric shall be capable of a flow rate of 70.3 L/minute/m², per ASTM Designation: D4491.

The sediment bag shall be sized to fit the catch basin or **drainage** inlet and be complete with lifting loops and dump straps attached at the bottom to facilitate emptying of the sediment bag. The sediment bags shall have a restraint cord approximately halfway up the bag to keep the sides away from the catch basin walls.

INSTALLATION AND MAINTENANCE

Temporary flexible dike consists of individual sections of dike installed in conjunction with one another adjacent to existing drainage inlets as shown on the plans. The spacing and angle of placement shall be in accordance with the table shown on the plans. Temporary flexible dike shall be installed flush against the sides of concrete or asphalt curbs, dikes and pavement with the inner material and fabric cover cut smoothly and evenly to provide a tight flush joint.

Temporary flexible dike and rock bag dike installed as part of temporary drainage inlet protection shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the deposit reaches one-half of the temporary flexible dike height. Removed sediment shall be deposited within the project in such a way that it is not subject to erosion by wind or water, or as directed by the Engineer.

Temporary rock bag dike consisting of filled rock bags placed in multiple layers shall be installed as shown on the plans.

When no longer required for the purpose, as determined by the Engineer, temporary drainage inlet protection facilities shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work.

Section 7-1.165, "Damage by Storm, Flood, Tsunami or Earthquake," of the Standard Specifications shall apply to temporary drainage inlet protection measures as a result of storm damage. Damage to temporary drainage inlet protection as a result of the Contractor's operations shall be replaced at the Contractor's expense.

Sediment bags shall be installed by removing the drainage inlet grate, placing the sediment bag in the opening, and replacing the grate to secure the sediment bag in place. Removal of the bag shall be facilitated by the use of 25 mm steel reinforcing bars placed through the lifting loops.

Sediment bags installed as part of temporary drainage inlet protection shall be emptied when the restraint cords are no longer visible. Emptying of the bag shall be facilitated by the use of 25 mm steel reinforcing bars placed through the lifting loops. The sediment bag shall be emptied of material and rinsed before replacement in the catch basin or drainage inlet.

Clean-up, repair, removal, disposal, improper installation and replacement of temporary drainage inlet protection damaged through the Contractor's negligence shall not be considered as included in the cost for performing maintenance and no additional compensation will be allowed therefor.

MEASUREMENT AND PAYMENT

The quantity of temporary drainage inlet protection to be paid for will be determined from each drainage inlet protected conforming to the details shown on the plans or as approved by the Engineer. The Drainage inlet protection is measured one time only and no additional measurement is recognized and no additional compensation made if the temporary drainage inlet protection changes during the course of construction.

Temporary Drainage Inlet Protection Types 2A, 2B, 3 and 4 shall be measured and paid for as Temporary Drainage Inlet Protection.

The contract unit price paid per temporary drainage inlet protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary drainage inlet protection, complete in place, including excavation and backfill, all modifications occurring during the course of construction, and removal of temporary drainage inlet protection, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary drainage inlet protection at drainage inlets other than as shown on the plans or directed by the Engineer, in accordance with the Contractor's Storm Water Pollution Prevention Plan will not be measured and paid for as temporary drainage inlet protection, and will be paid for as specified in "Water Pollution Control" elsewhere in these special provisions.

The cost for maintaining the temporary drainage inlet protection will be divided equally by the State and the Contractor.

The division of cost will be made by determining the cost of maintaining temporary drainage inlet protection in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications. Clean-up, repair, removal, disposal, and replacement due to improper installation, and replacement of temporary drainage inlet protection damaged as a result of the Contractor's negligence will not be considered as included in the cost for performing maintenance.

10-1.03 WATER POLLUTION CONTROL

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project lies within the boundaries of the San Francisco Bay Regional Water Quality Control Board (RWQCB).

The State Water Resources Control Board (SWRCB) has issued a permit to the Department which governs storm water and non-storm water discharges from its properties, facilities and activities. The Department's Permit is entitled: "Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation Properties, Facilities, and Activities." A copy of the permit may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov, and may also be obtained from the SWRCB Internet website at: <http://www.swrcb.ca.gov/stormwtr/caltrans.html>.

The Department's Permit references and incorporates by reference the current Statewide General Permit issued by the SWRCB entitled "Order No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Associated with Construction Activity," which regulates discharges of storm water and non-storm water from construction activities disturbing 0.4-hectare or more of soil in a common plan of development. Sampling and analysis requirements as specified in SWRCB Resolution No. 2001-46 are added to the Statewide General Permit. A copy of the permit and modifications thereto may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection at the Department of Transportation, District 04, Construction Office Duty Senior, 111 Grand Avenue, Oakland, CA 94612, telephone number (510) 286-5209, email: duty_senior_district04@dot.ca.gov, and may also be obtained from the SWRCB Internet website at: <http://www.swrcb.ca.gov/stormwtr/construction.html>.

The NPDES permit that regulate this project, as referenced above, are hereafter collectively referred to as the "Permits."

This project shall conform to the Permits and modifications thereto. The Contractor shall maintain copies of the Permits at the project site and shall make the Permits available during construction.

The Permits require the preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall be prepared in conformance with the requirements of the Permits, the Department's "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual," and the Department's "Construction Site Best Management Practices (BMPs) Manual," including addenda to those permits and manuals issued up to and including the date of advertisement of the project. These manuals are hereinafter referred to, respectively, as the "Preparation Manual" and the "Construction Site BMPs Manual," and collectively, as the "Manuals." Copies of the Manuals may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520, and may also be obtained from the Department's Internet website at: <http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm>.

The Contractor shall know and fully comply with applicable provisions of the Permits and all modifications thereto, the Manuals, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.01, "Laws to be Observed," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

The Permits shall apply to storm water and certain permitted non-storm water discharges from areas outside the project site which are directly related to construction activities for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards and access roads. The Contractor shall comply with the Permits and the Manuals for those areas and shall implement, inspect and maintain the required water pollution control practices. The Engineer shall be allowed full access to these areas during construction to assure Contractor's proper implementation of water pollution control practices. Installing, inspecting and maintaining water pollution control practices

on areas outside the highway right of way not specifically arranged and provided for by the Department for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or the Department as a result of the Contractor's failure to comply with the provisions in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Permits, the Manuals, and Federal, State and local regulations and requirements as set forth therein.

Penalties as used in this section, "Water Pollution Control," shall include fines, penalties and damages, whether proposed, assessed, or levied against the Department or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of the Permits, the Manuals, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

RETENTION OF FUNDS

Notwithstanding any other remedies authorized by law, the Department may retain money due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of Penalties proposed, assessed, or levied as a result of the Contractor's violation of the Permits, the Manuals, or Federal or State law, regulations or requirements. Funds may be retained by the Department until final disposition has been made as to the Penalties. The Contractor shall remain liable for the full amount of Penalties until such time as they are finally resolved with the entity seeking the Penalties.

Retention of funds for failure to conform to the provisions in this section, "Water Pollution Control," shall be in addition to the other retention amounts required by the contract. The amounts retained for the Contractor's failure to conform to provisions in this section will be released for payment on the next monthly estimate for partial payment following the date when an approved SWPPP has been implemented and maintained, and when water pollution has been adequately controlled, as determined by the Engineer.

When a regulatory agency identifies a failure to comply with the Permits and modifications thereto, the Manuals, or other Federal, State or local requirements, the Department may retain money due the Contractor, subject to the following:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
- B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
- C. If the Department has retained funds, and it is subsequently determined that the State is not subject to the entire amount of the Costs and Liabilities assessed or proposed in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained for the period of the retention. The interest rate payable shall be 6 percent per annum.

During the first estimate period that the Contractor fails to conform to the provisions in this section, "Water Pollution Control," the Department may retain an amount equal to 25 percent of the estimated value of the contract work performed.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND AMENDMENTS

As part of the water pollution control work, a Storm Water Pollution Prevention Plan (SWPPP) is required for this contract. The SWPPP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, the requirements of the Permits, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be considered to fulfill the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, shall be performed until the SWPPP has been approved by the Engineer. Approval shall not constitute a finding that the SWPPP complies with applicable requirements of the Permits, the Manuals and applicable Federal, State and local laws, regulations, and requirements.

The Contractor shall designate a Water Pollution Control Manager. The Water Pollution Control Manager shall be responsible for the preparation of the SWPPP and required modifications or amendments, and shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The Contractor may designate different Water Pollution Control Managers to prepare the SWPPP and to implement the water pollution control practices. The Water Pollution Control Managers shall serve as the primary contact for issues related to the SWPPP or its implementation. The Contractor shall submit to the Engineer a statement of qualifications, describing the training, previous work history and expertise of the individual selected by the Contractor to serve as Water Pollution Control Manager. The Water Pollution Control Manager shall have a minimum of 24 hours of formal storm water management training or certification as a Certified Professional in Erosion and Sediment Control (CPESC). The Engineer will reject the Contractor's submission of a Water Pollution Control Manager if the submitted qualifications are deemed to be inadequate.

The SWPPP shall apply to the areas within and those outside of the highway right of way that are directly related to construction operations including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards, and access roads.

The SWPPP shall incorporate water pollution control practices in the following categories:

- A. Soil stabilization.
- B. Sediment control.
- C. Wind erosion control.
- D. Tracking control.
- E. Non-storm water management.
- F. Waste management and materials pollution control.

The following contract items of work shall be incorporated into the SWPPP as "Temporary Water Pollution Control Practices": Temporary Cover, Temporary Silt Fence, Temporary Soil Stabilizer, Temporary Drainage Inlet Protection, Temporary Concrete Washout Facility, Temporary Construction Entrance, and Move In/Move Out (Erosion Control). The Contractor's attention is directed to the special provisions provided for Temporary Water Pollution Control Practices.

The following contract items of work, as shown on the project plans or as specified elsewhere in these special provisions, shall be identified in the SWPPP as permanent water pollution control practices: Erosion Control Netting and Erosion Control (Type D). These permanent water pollution control practices shall be constructed as specified in these special provisions, and utilized during the construction period. The Contractor shall maintain and protect the permanent water pollution control practices throughout the duration of the project and shall restore these controls to the lines, grades and condition shown on the plans prior to acceptance of the contract.

The SWPPP shall include, but not be limited to, the items described in the Manuals, Permits and related information contained in the contract documents.

The Contractor shall develop and include in the SWPPP the Sampling and Analysis Plan(s) as required by the Permits, and modifications thereto, and as required in "Sampling and Analytical Requirements" of this section.

The Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

The Contractor shall complete the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual and shall incorporate water pollution control practices into the SWPPP. Water pollution control practices include the "Minimum Requirements" and other Contractor-selected water pollution control practices from the "Construction Site BMPs Consideration Checklist" and the "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

Within 20 calendar days after the approval of the contract, the Contractor shall submit 3 copies of the draft SWPPP to the Engineer. The Engineer will have 50 calendar days to submit the SWPPP to regulatory agencies for plan review and to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 15 calendar days of receipt of the Engineer's comments. The Engineer will have 10 calendar days to review the revisions. Upon the Engineer's approval of the SWPPP, 5 approved copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The Contractor shall prepare an amendment to the SWPPP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, municipal storm drain systems, or when the Contractor's activities or operations violate a condition of the Permits, or when directed by the Engineer. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved SWPPP. Amendments to the SWPPP shall be prepared and submitted for review and approval within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the SWPPP.

The Contractor shall keep one copy of the approved SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the local storm water management agency. Requests by the public shall be directed to the Engineer.

COST BREAK-DOWN

The Contractor shall include a Water Pollution Control Cost Break-Down in the SWPPP which itemizes the contract lump sum for water pollution control work. The Contractor shall use the Water Pollution Control Cost Break-Down provided in this section as the basis for the cost break-down submitted with the SWPPP. The Contractor shall use the Water Pollution Control Cost Break-Down to identify items, quantities and values for water pollution control work, excluding Temporary Water Pollution Control Practices for which there are separate bid items. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted with the SWPPP. Partial payment for the item of water pollution control will not be made until the Water Pollution Control Cost Break-Down is approved by the Engineer.

Attention is directed to "Time-Related Overhead" of these special provisions regarding compensation for time-related overhead.

Line items indicated in the Water Pollution Control Cost Break-Down in this section with a specified Estimated Quantity shall be considered "Project-Specific Minimum Requirements." The Contractor shall incorporate Project-Specific Minimum Requirements with Contractor-designated quantities and values into the Water Pollution Control Cost Break-Down submitted with the SWPPP.

Line items indicated in the Water Pollution Control Cost Break-Down in this section without a specified Estimated Quantity shall be considered by the Contractor for selection to meet the applicable "Minimum Requirements" as defined in the Manuals, or for other water pollution control work as identified in the "Construction Site BMPs Consideration Checklist" presented in the Preparation Manual. In the Water Pollution Control Cost Break-Down submitted with the SWPPP, the Contractor shall list only those water pollution control practices selected for the project, including quantities and values required to complete the work for those items.

The sum of the amounts for the items of work listed in the Water Pollution Control Cost Break-Down shall be equal to the contract lump sum price bid for water pollution control. Overhead and profit, except for time-related overhead, shall be included in the individual items listed in the cost break-down.

WATER POLLUTION CONTROL COST BREAK-DOWN

Contract No. 04-0120Q4

ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
SS-8	Wood Mulching	M2			
SS-9	Earth Dikes/Drainage Swales & Lined Ditches	M			
SS-10	Outlet Protection/Velocity Dissipation Devices	EA			
SS-11	Slope Drains	EA			
SC-7	Street Sweeping and Vacuuming	LS			
WE-1	Wind Erosion Control	LS			
TC-2	Stabilized Construction Roadway (Rock and Geotextile)	M3	100		
NS-3	Paving and Grinding Operations	LS			
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	LS			
NS-8	Vehicle and Equipment Cleaning	LS			
NS-9	Vehicle and Equipment Fueling	LS			
NS-10	Vehicle and Equipment Maintenance	LS			
WM-1	Material Delivery and Storage	LS			
WM-2	Material Use	LS			
WM-4	Spill Prevention and Control	LS			
WM-5	Solid Waste Management	LS			
WM-6	Hazardous Waste Management	LS			
WM-9	Sanitary/Septic Waste Management	LS			

TOTAL _____

Adjustments in the items of work and quantities listed in the approved cost break-down shall be made when required to address amendments to the SWPPP, except when the adjusted items are paid for as extra work.

No adjustment in compensation will be made to the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved SWPPP. No adjustment in compensation will be made for ordered changes to correct SWPPP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break-down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of water pollution control due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications. If an ordered change requires a new item which is not on the approved cost break-down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

If requested by the Contractor and approved by the Engineer, changes to the water pollution control practices listed in the approved cost break-down, including addition of new water pollution control practices, will be allowed. Changes shall be included in the approved amendment of the SWPPP. If the requested changes result in a net cost increase to the lump sum price for water pollution control, an adjustment in compensation will be made without change to the water pollution control item. The net cost increase to the water pollution control item will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

SWPPP IMPLEMENTATION

Unless otherwise specified, upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices specified in the SWPPP and in the amendments. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout temporary suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of water pollution control practices shall conform to the requirements in the Manuals and these special provisions.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately unless requested by the Contractor and approved by the Engineer in writing, but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section, "Water Pollution Control." Attention is directed to Section 5-1.01, "Authority of Engineer," of the Standard Specifications, and to "Retention of Funds" of this section for possible nonconformance penalties.

If the Contractor fails to conform to the provisions of this section, "Water Pollution Control," the Engineer may order the suspension of construction operations until the project complies with the requirements of this section.

Implementation of water pollution control practices may vary by season. The Construction Site BMPs Manual and these special provisions shall be followed for control practice selection of year-round, rainy season and non-rainy season water pollution control practices.

Year-Round Implementation Requirements

The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 21 days. Non-active areas shall be protected as prescribed in the Construction Site BMPs Manual within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

In order to provide effective erosion control, the Contractor may be directed by the Engineer to apply permanent erosion control in small or multiple units. The Contractor's attention is directed to "Erosion Control (Type D)" and "Move-In/Move-Out (Erosion Control)" of these special provisions.

The Contractor shall implement, maintain and inspect the following temporary sediment control practices on a year-round basis. The listed practices shall remain in place until their use is no longer needed, as determined by the Engineer.

YEAR-ROUND SEDIMENT CONTROL PRACTICES	LOCATION USED
SC-7 Street Sweeping and Vacuuming	Entrance/Exit to paved roads
TC-2 Stabilized Construction Roadway	Unstable access roadways and work areas

Rainy Season Implementation Requirements

Soil stabilization and sediment control practices shall be provided throughout the rainy season, defined as between October 15 and April 15.

An implementation schedule of required soil stabilization and sediment control practices for disturbed soil areas shall be completed no later than 20 days prior to the beginning of each rainy season. The implementation schedule shall identify the soil stabilization and sediment control practices and the dates when the implementation will be 25 percent, 50 percent and 100 percent complete, respectively. For construction activities beginning during the rainy season, the Contractor shall implement applicable soil stabilization and sediment control practices. The Contractor shall implement soil stabilization and sediment control practices a minimum of 10 days prior to the start of the rainy season.

Throughout the defined rainy season, the active disturbed soil area of the project site shall be not more than 0.8 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active disturbed soil area limit. Soil stabilization and sediment control materials shall be maintained on site sufficient to protect disturbed soil areas. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to deploy the water pollution control practices required to protect disturbed soil areas prior to the onset of precipitation.

Non-Rainy Season Implementation Requirements

The non-rainy season shall be defined as days outside the defined rainy season. The Contractor's attention is directed to the Construction Site BMPs Manual for soil stabilization and sediment control implementation requirements on disturbed soil areas during the non-rainy season. Disturbed soil areas within the project shall be protected in conformance with the requirements in the Construction Site BMPs Manual with an effective combination of soil stabilization and sediment control.

MAINTENANCE

To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the SWPPP. The construction site shall be inspected by the Contractor as follows:

- A. Prior to a forecast storm.
- B. After a precipitation event which causes site runoff.
- C. At 24 hour intervals during extended precipitation events.
- D. Routinely, a minimum of once every 14 calendar days outside of the defined rainy season.
- E. Routinely, a minimum of once every 7 calendar days during the defined rainy season.

The Contractor shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 24 hours of completing the inspection.

REPORTING REQUIREMENTS

Report of Discharges, Notices or Orders

If the Contractor identifies discharges into surface waters or drainage systems in a manner causing, or potentially causing, a condition of pollution, or if the project receives a written notice or order from a regulatory agency, the Contractor shall immediately inform the Engineer. The Contractor shall submit a written report to the Engineer within 7 days of the discharge event, notice or order. The report shall include the following information:

- A. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
- B. The water pollution control practices deployed before the discharge event, or prior to receiving the notice or order.
- C. The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent reoccurrence.
- D. An implementation and maintenance schedule for affected water pollution control practices.

Report of First-Time Non-Storm Water Discharge

The Contractor shall notify the Engineer at least 3 days in advance of first-time non-storm water discharge events, excluding exempted discharges. The Contractor shall notify the Engineer of the operations causing non-storm water discharges and shall obtain field approval for first-time non-storm water discharges. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

Annual Certifications

By June 15 of each year, the Contractor shall complete and submit an Annual Certification of Compliance, as contained in the Preparation Manual, to the Engineer.

SAMPLING AND ANALYTICAL REQUIREMENTS

The Contractor is required to implement specific sampling and analytical procedures to determine whether BMPs implemented on the construction site are:

- A. preventing pollutants that are known or should be known by permittees to occur on construction sites that are not visually detectable in storm water discharges, to cause or contribute to exceedances of water quality objectives

Non-Visible Pollutants

The project has the potential to discharge non-visible pollutants in storm water from the construction site. The project SWPPP shall contain a Sampling and Analysis Plan (SAP) that describes the sampling and analysis strategy and schedule to be implemented on the project for monitoring non-visible pollutants in conformance with this section.

The SAP shall identify potential non-visible pollutants that are known or should be known to occur on the construction site associated with the following: (1) construction materials, wastes or operations; (2) known existing contamination due to historical site usage; or (3) application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water. Planned material and waste storage areas, locations of known existing contamination, and areas planned for application of soil amendments shall be shown on the SWPPP Water Pollution Control Drawings.

The SAP shall identify a sampling schedule for collecting a sample down gradient from the applicable non-visible pollutant source and a sufficiently large uncontaminated control sample during the first two hours of discharge from rain events during daylight hours which result in a sufficient discharge for sample collection. If run-on occurs onto the non-visible pollutant source, a run-on sample that is immediately down gradient of the run-on to the Department's right of way shall be collected. A minimum of 72 hours of dry weather shall occur between rain events to distinguish separate rain events.

The SAP shall state that water quality sampling will be triggered when any of the following conditions are observed during the required storm water inspections conducted before or during a rain event:

- A. Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions.
- B. Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.
- C. Construction activities, such as application of fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound have occurred during a rain event or within 24 hours preceding a rain event, and there is the potential for discharge of pollutants to surface waters or drainage system.
- D. Soil amendments, including soil stabilization products, with the potential to alter pH levels or contribute toxic pollutants to storm water runoff have been applied, and there is the potential for discharge of pollutants to surface waters or drainage system (unless independent test data are available that demonstrate acceptable concentration levels of non-visible pollutants in the soil amendment).
- E. Storm water runoff from an area contaminated by historical usage of the site is observed to combine with storm water, and there is the potential for discharge of pollutants to surface waters or drainage system.

The SAP shall identify sampling locations for collecting down gradient and control samples, and the rationale for their selection. The control sampling location shall be selected where the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. Sampling locations shall be shown on the SWPPP Water Pollution Control Drawings. Only trained personnel shall collect water quality samples and be identified in the SAP. Qualifications of designated sampling personnel shall describe training and experience, and shall be included in the SWPPP. The SAP shall state monitoring preparation, sample collection procedures, quality assurance/quality control, sample labeling procedures, sample collection documentation, sample shipping and chain of custody procedures, sample numbering system, and reference the construction site health and safety plan.

The SAP shall identify the analytical method to be used for analyzing down gradient and control samples for potential non-visible pollutants on the project. For samples analyzed in the field by sampling personnel, collection, analysis, and equipment calibration shall be in conformance with the Manufacturer's specifications. For samples that will be analyzed by a laboratory, sampling, preservation, and analysis shall be performed by a State-certified laboratory in conformance with 40 CFR 136. The SAP shall identify the specific State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method to be used. A list of State-certified laboratories that are approved by the Department is available at the following internet site: http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm.

Analytical Results and Evaluation

The Contractor shall submit a hard copy and electronic copy of water quality analytical results and quality assurance/quality control data to the Engineer within 5 days of sampling for field analyses and within 30 days for laboratory analyses. Analytical results shall be accompanied by an evaluation from the Contractor to determine if down gradient samples show elevated levels of the tested parameter relative to levels in the control sample. If down gradient or downstream samples, as applicable, show increased levels, the Contractor will assess the BMPs, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify BMPs to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt, .csv, .dbs, or .mdb) shall have at a minimum the following information: sample identification number, contract number, constituent, reported value, method reference, method detection limit, and reported detection limit. The Contractor shall document sample collection during rain events.

Water quality sampling documentation and analytical results shall be maintained with the SWPPP on the project site until a Notice of Completion has been submitted and approved.

If construction activities or knowledge of site conditions change, such that discharges or sampling locations change, the Contractor shall amend the SAP in conformance with this section, "Water Pollution Control."

PAYMENT

The contract lump sum price paid for prepare storm water pollution prevention plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising, and amending the SWPPP, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Attention is directed to Section 9-1.06, "Partial Payments," and Section 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for prepare storm water pollution prevention plan will be made as follows:

- A. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate.
- B. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, removing, and disposing of water pollution control practices, including non-storm water management, and waste management and materials pollution water pollution control practices, except those for which there is a contract item of work as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Storm water sampling and analysis will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. No payment will be made for the preparation, collection, analysis, and reporting of storm water samples required where appropriate BMPs are not implemented prior to a rain event, or if a failure of a BMP is not corrected prior to a rain event.

For items identified on the approved Water Pollution Control Cost Break-Down, the cost of maintaining the temporary water pollution control practices shall be divided equally by the State and the Contractor as follows:

Soil Stabilization

Temporary water pollution control practices except:
SS-1 Scheduling
SS-2 Preservation of Existing Vegetation

Sediment Control

Temporary water pollution control practices except:
SC-7 Street Sweeping and Vacuuming

Wind Erosion Control

No sharing of maintenance costs will be allowed.

Tracking Control

TC-1 Stabilized Construction Entrance/Exit.

Non-Storm Water Management

No sharing of maintenance costs will be allowed.

Waste Management & Materials Pollution Control

No sharing of maintenance costs will be allowed.

The division of cost will be made by determining the cost of maintaining water pollution control practices in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Cleanup, repair, removal, disposal, improper installation, and replacement of water pollution control practices damaged by the Contractor's negligence, shall not be considered as included in the cost for performing maintenance.

The provisions for sharing maintenance costs shall not relieve the Contractor from the responsibility for providing appropriate maintenance on items with no shared maintenance costs.

Full compensation for non-shared maintenance costs of water pollution control practices, as specified in this section, "Water Pollution Control," shall be considered as included in the contract lump sum price paid for water pollution control and no additional compensation will be allowed therefor.

Water pollution control practices for which there is a contract item of work, will be measured and paid for as that contract item of work.

10-1.04 NON-STORM WATER DISCHARGES

Non-storm water discharges shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications, "Water Pollution Control" of these special provisions, and these special provisions.

LAND-BASED EXCAVATION DEWATERING

This work shall include discharging water from land-based excavations including, but not limited to, excavations for pile caps or footings, piles, storm drainage systems, sanitary sewer systems, walls and appurtenances. These provisions shall not apply to seepage from seasonal percolation of rainwater at elevations greater than 6.0 m, except that those dewatering operations shall be described in the Dewatering Plan as specified herein. Discharges from elevations greater than 6.0 m shall be performed in conformance with Order No. R2-2002-0011, including allowable increases in natural background turbidity, pH, and dissolved oxygen, and "Water Pollution Control" of these special provisions.

Excavation dewatering shall be performed in conformance with the general waste discharge requirements for Order No. 01-100, NPDES General Permit No. CAG912002, issued by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) for "Discharge of Treated Groundwater Polluted by Fuel Leaks" and these special provisions. Copies of the permit are available for inspection at the Department of Transportation, Duty Senior's Desk, 111 Grand Avenue, Oakland, California, email; duty_senior_district04@dot.ca.gov, telephone (510) 286-5209 or on the Internet at:

http://www.swrcb.ca.gov/rwqcb2/npdes_gen__permit.htm

The Contractor shall be fully informed of the provisions of the permit and conduct the work accordingly. The Department will submit the Notice of Intent (NOI) to initiate the discharge. The Contractor shall prepare, for inclusion in the NOI, a report certifying the adequacy of each component of the planned treatment facility and an Operation and Maintenance Manual in conformance with Order No. 01-100 and these special provisions. The Contractor shall pay all fees assessed by the SFRWQCB in connection with the discharge. Permit fees will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

At the option of the Contractor, water removed from the excavation may be hauled off site to an appropriately licensed liquid disposal facility in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Surface runoff shall not be allowed to enter the excavation. Groundwater contaminated by the Contractor's operations, such as the use of slurry to construct cast-in-place piles, shall be treated to meet the permit requirements for discharge or removed from the site to an appropriately licensed liquid disposal facility in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Based on the material type and groundwater gradients within the project limits, it is expected that the groundwater flow rate will be up to 180.0 L/minute. The treatment facility shall be designed to accommodate this flow rate. Continuous pumping from well points outside the excavations will not be allowed. The Contractor shall use construction methods that prevent cross-contamination of water-bearing zones below elevation -3.0 m caused by the flow of contaminated groundwater into piling excavations including, but not limited to, sheet piling, extended pipe piles, and temporary casing. A meter that has been approved by the Engineer shall be used to measure all excavation discharges.

Treated groundwater shall be used for dust control up to the extent that sheet flow or ponding becomes imminent. When further use of the treated water as dust control would result in sheet flow or ponding, the water shall be discharged at an approved dedicated discharge point.

Analysis results of grab samples from groundwater within the limits of the project are summarized in the following table:

GROUNDWATER CONTAMINANT SUMMARY

Sample ID.	W5LC	EB6R	EB7R
Metals			
Antimony	0.010		
Arsenic	0.22		
Barium	2.5		
Beryllium	<0.0030		
Cadmium	<0.0030		
Chromium	1.2		
Cobalt	0.34		
Copper	0.27		
Lead	0.10		
Mercury	<0.0040		
Molybdenum	<0.0050		
Nickel	1.4		
Selenium	<0.0050		
Silver	<0.0030		
Thallium	<0.0050		
Vanadium	0.66		
Zinc	0.71		
VOCs	Benzene = 0.00088 M,p-Xylene = 0.00080 o-Xylene = 0.0016 1,2,4-Trimethyl-benzene = 0.0063 Naphthalene = 0.039	< 0.005	< 0.005
SVOCs	2-Methyl-naphthalene = 0.068 Fluorene = 0.011 Naphthalene = 0.031 Phenanthrene = 0.011	ND	ND
TPHg	0.57	< 0.050	0.12
TPHd	13	160	1200
TPHmo	9.1		

GROUNDWATER CONTAMINANT SUMMARY (CONT.)

Sample ID.	EB8L	EB9L	EB10R	EB13L	EB14R
Metals					
Antimony				0.0093	0.010
Arsenic				0.010	0.030
Barium				0.67	1.1
Beryllium				<0.0010	<0.0010
Cadmium				<0.0030	<0.0030
Chromium				<0.0030	0.050
Cobalt				0.0036	0.010
Copper				0.040	0.29
Lead				0.14	4.1
Mercury				<0.0040	<0.0040
Molybdenum				0.010	0.010
Nickel				<0.0030	0.040
Selenium				0.0079	0.0060
Silver				0.0096	0.010
Thallium				<0.0050	<0.0050
Vanadium				0.0041	0.040
Zinc				0.21	2.4
VOCs	< 5.0			<0.005	< 0.005
SVOCs	2-Methyl-naphthalene = 13 Phenanthrene = 12	ND	ND	Phenanthrene = .093	ND
TPHg	0.3			0.33	0.48
TPHd	44	3.1	5.6	36	440
TPHmo					

Notes:

Concentrations are shown in milligrams per liter.

Sample locations are shown in the "Materials Information"

When no concentration is given, samples were not analyzed for that group of contaminants.

Abbreviations:

ND Not detected above laboratory reporting limit

VOCs Volatile Organic Compounds

SVOCs Semi-Volatile Organic Compounds

TPHg Total Petroleum Hydrocarbons as gasoline

TPHd Total Petroleum Hydrocarbons as diesel

TPHmo Total Petroleum Hydrocarbons as motor oil

The Contractor shall submit to the Engineer, as provided in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, a Dewatering Plan that includes the following:

- A. Dewatering Operation Description - written description of all dewatering operations that shall include, but is not limited to, start up date of discharge, an estimate of the discharge volume, flow rate, frequency, and maximum capacity of the treatment facility.
- B. Certification of Treatment Facility Design - report describing the adequacy of (1) the process and design of the treatment facility to meet treatment objectives, (2) the startup and operation instruction manuals, (3) the treatment facility maintenance and testing program; and (4) the influent and effluent sampling locations. This certification shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California.
- C. Treatment Facility Operation and Maintenance Manual - manual of operation for the treatment facility that describes staffing and training, quality control and assurance, inspection and maintenance, monitoring, records keeping, and preventative and contingency plans for controlling accidental discharges.
- D. Working Drawings - working drawings of dewatering operations showing both a sectional and plan view that details the removal techniques for suspended solids and known or introduced groundwater contaminants. The drawings shall define the flow path and placement of pipes, hoses, pumps, treatment systems, holding tanks, and

other equipment used to convey the discharge; the general position of the dewatering measures relative to the excavations undergoing dewatering; and the point of effluent discharge.

The plan shall be submitted 25 working days before beginning dewatering operations for review and approval by the Engineer. Excavation operations that require dewatering will not be allowed until the plan has been approved by the Engineer and the SFRWQCB Executive Officer has authorized the discharge. At the time of approval, the Contractor shall incorporate the dewatering plan into the approved SWPPP via the established amendment process as described within "Water Pollution Control (Storm Water Pollution Prevention Plan)" of these special provisions.

Monitoring of discharges shall conform to the requirements of Order No. 01-100, the Self-Monitoring Program included with Order No. 01-100, and these special provisions. The required Start-up Report, Self-Monitoring Reports, Spill Reports, Violation Reports, and letter of transmittal shall be submitted to the Engineer who will forward the information to SFRWQCB. Spills and violations shall be reported to the Engineer within 24 hours of discovery and will be confirmed in writing to the Engineer within 4 working days. All standard observations specified in the Self-Monitoring Program included with Order No. 01-100 shall be recorded in a standard format. After 6 months of monitoring, the Engineer may request that SFRWQCB review the results in order to modify the Self-Monitoring Program for Order No. 01-100 to address only constituents of concern. In the event that a modification is granted, adjustments in compensation for sampling, analysis and reporting will be made in conformance with Section 4-1.03, "Changes," of the Standard Specifications.

In addition to the monitoring requirements of Order No. 01-100, the Contractor shall monitor the discharge for turbidity. Turbidity shall be measured in Nephelometric Turbidity Units (NTU).

For the purposes of the Start-up Report, start-up shall be considered the first use of the system. After that, when a new point of influent having different contaminants or greater concentrations than previously treated is added to the facility, samples shall be collected and analyzed as specified for start-up but a Start-up Report shall not be prepared.

In the event that a violation of the maximum daily limits or turbidity measurement greater than 50 NTU occurs and is confirmed by an additional measurement obtained no less than 15 minutes and no more than 1 hour after the initial measurement, the discharge activity shall be shutdown and corrective actions shall be taken to modify, repair, or replace the equipment used for the discharge. The resumption of discharge activities shall be allowed upon approval of the corrective measures by the Engineer.

EFFLUENT TREATMENT FACILITY

An effluent treatment facility shall be provided to treat petroleum contaminated water discharged from dewatering operations. Effluent shall be considered as the water and any other material discharged from the dewatering operations.

The Contractor shall use the effluent treatment facility to treat water from excavations before discharging to an approved discharge site in accordance with Order No. 01-100 and these special provisions. Protection shall be provided at the outlet of treated effluent into the receiving water body to ensure that bottom sediments, aquatic vegetation, or surface soils do not become dislodged or disturbed.

Materials shall conform to the provisions in Section 6, "Control of Materials," Section 7-1.16, "Contractor's Responsibility for the Work and Materials," Section 20-5.03E, "Pipe," and Section 74-2, "Drainage Pump Equipment," of the Standard Specifications and these special provisions.

Holding tanks for pretreatment storage shall be transportable and totally enclosed, with a minimum holding capacity sufficient to prevent delay of other work and capable of connecting multiple tanks in series. Holding tanks shall have an inlet and outlet capable of receiving and discharging minimum flows, at a rate sufficient to reach the treatment goals. Holding tanks shall be able to accommodate temporary installation of submersible pumps. All tanks shall remain within the project limits until dewatering operations are no longer necessary as determined by the Engineer.

Granulated activated carbon (GAC) shall be used as the medium to treat groundwater contaminated with petroleum hydrocarbons as noted in the contaminant summary table. The GAC treatment system shall be designed to meet the treatment goals specified in Order No. 01-100. The GAC treatment vessels shall be readily removed and replaced or interchanged when required. The GAC treatment system shall have appropriate fittings for pipe connections designed to accommodate the required flow rate. Throughout the operation, the Contractor shall have additional GAC treatment vessels available for transport and use at the site if the monitoring results indicate that the GAC treatment vessels currently in use will not continue to meet the treatment goals of Order No. 01-100. Pretreatment of the groundwater to prevent sediment build up within the GAC treatment vessels shall be provided when necessary.

Sampling ports shall be spigots attached to the piping system and capable of obtaining a representative sample of water at locations within the effluent treatment facility where constituent concentrations are needed to ensure compliance with Order 01-100 and to inspect the efficiency of the facility. The effluent treatment facility shall be capable of sustaining temporary fluctuations in water pressure due to monitoring activities.

Pumps shall be capable of being submerged in water and discharging water and other materials including, but not limited to small rocks, gravel, sand and sediments. The submersible pumps shall be capable, at all times, of discharging at a flow

rate that will match the flow rate through the GAC vessels. An additional submersible pump shall be provided by the Contractor that is capable of discharging treated effluent from a temporary holding container to the dedicated discharge location.

The Contractor shall be responsible for providing and installing all piping required to circulate the effluent through the treatment facility and all piping required to convey the treated effluent from the temporary holding container to the point of release at the dedicated discharge location.

A holding tank shall be provided between the GAC treatment system outlet and the discharge location with a minimum storage capacity of 1800 L. The holding container shall have an inlet and outlet capable of receiving and discharging minimum flows that can match the flow rate through the GAC vessels. The holding container shall be open to the air and sealed on all sides and the bottom to prevent any leakage.

Sediments removed during maintenance of the treatment facility shall be characterized by laboratory analysis before disposal. Contaminated sediments shall be removed from the site to an appropriately licensed waste management facility in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Disposal of contaminated sediments, as determined by analysis, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

INSPECTION

The Contractor shall conduct a daily inspection of the dewatering equipment, when in use, and ensure that all components are functional and routinely maintained to prevent leakage before removal of suspended solids and petroleum hydrocarbons. If any component of the dewatering equipment is damaged so that the performance of the equipment is diminished below allowable operational levels, the dewatering operation shall be discontinued and the component shall be repaired or replaced with substitute equipment.

SPILL CONTINGENCY

The Contractor shall prepare and submit to the Engineer a contingency plan for the management of spills or leaks of any materials or wastes that may impact the water quality of the San Francisco Bay.

The spill contingency plan shall be incorporated within the SWPPP, as specified in "Water Pollution Control (Storm Water Pollution Prevention Plan)" of these special provisions.

The contingency plan shall include instructions and procedures for reporting spills, and a list of spill containment and collection materials and equipment to be maintained onsite. The contingency plan shall be reviewed and updated quarterly.

LIQUIDS, RESIDUES AND DEBRIS

The Contractor shall prevent the discharge of slurries, liquids, residues, or debris produced during the work to storm water facilities or surface waters of the State. The SWPPP shall, at a minimum, depict and describe the procedural and structural methods of containing, collecting, and disposing of all slurries, liquids, residues, and debris associated with the operations. Sufficient redundancy shall be incorporated into the procedural and structural methods such that the slurries, liquids, residues, and debris are not conveyed into or become present in drainage systems, San Francisco Bay, or other water bodies.

PAYMENT

The contract lump sum price paid for non-storm water discharges shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in non-storm water discharges; complete in place, excluding permit fees and disposal of contaminated sediment resulting from treatment facility maintenance, as shown on the plans, as specified in the Standard Specifications, and these special provisions, and as directed by the Engineer.

10-1.05 TEMPORARY SOIL STABILIZER

Temporary soil stabilizer shall be applied to control the amount of bare active and non active disturbed areas as described in "Water pollution Control" elsewhere in these special provisions. Temporary soil stabilizer shall be applied in accordance with these special provisions.

Temporary soil stabilizer shall consist of applying a bonded fiber matrix mixture to active and non active disturbed areas.

Preparation shall conform to the provisions in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following requirements for soil stabilizers:

Fiber

Fiber shall conform to the provisions in Section 20-2.07, "Fiber," of the Standard Specifications and these special provisions. Fiber shall be long strand, virgin wood fibers, thermo-mechanically defibrated from clean whole wood chips, containing a minimum of 25% of the fibers averaging 10 mm long, with a minimum of 50% or more retained on a #24 mesh screen. The wood chips shall be processed in such manner to contain no lead paint, printing ink, varnish, petroleum products, or seed germination inhibitors. Fiber shall not be produced from recycled material such as sawdust, paper, cardboard, or chlorine bleached paper mill residue. A coloring agent shall be included and shall be biodegradable and non-toxic.

Emulsion Material (Solids)

Stabilizing emulsion (solids) shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions. Stabilizing emulsion (solids) shall be nonflammable, non-toxic to plants and animals, shall have no growth or germination inhibiting factors, and shall have an effective life of at least one year.

Stabilizing emulsion (solids) shall be an organic bonding tackifier of high viscosity colloidal polysaccharide with activating agents, or a blended hydrocolloid-based binder. The stabilizing emulsion (solids) shall not dissolve or disperse upon rewetting. The stabilizing emulsion (solids) shall be bonded to the fiber or prepackaged with the fiber by the manufacturer. The stabilizing emulsion (solids), including activating agents and additives, shall be 10 percent by weight, minimum, of the fiber.

APPLICATION

Temporary soil stabilizer shall be applied in successive layers to avoid slumping and aid drying. Materials shall be applied from two or more directions to avoid shadowing effects and to cover 100% of the soil surface, not less than 3 mm deep and as follows:

The first application shall consist of applying water to all areas, with hydro-seeding equipment, to be treated with the soil stabilizer. Water shall be applied uniformly and with the proper nozzle to disperse the flow such that the soil surface is thoroughly wet but not to the extent to where excessive runoff is generated. All soil areas to be stabilized must be wet prior to the application of stabilizing emulsion.

Successive applications shall follow consisting of applying the following mixture with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope measurement)
Bonded Fiber*	4000.00

*Includes fiber and stabilizing emulsion (solids).

The dilution of stabilizing emulsion (solids) to water (liter) per hectare shall be as required to facilitate even application of material. Several applications may be required to apply all specified materials.

The application of soil stabilizer will be applied in a down slope direction to provide uniform coverage when possible. Application of material shall be performed during dry weather with a minimum of 8 hours of dry weather predicted following application prior to any anticipated rain.

Any areas disturbed or displaced by construction operations or equipment following application shall be replaced by the Contractor at no cost to the State.

Stabilizers shall not be applied to areas with standing water.

MEASUREMENT AND PAYMENT

Temporary soil stabilizer will be measured and paid for by the square meter.

Soil stabilizer placed at locations other than as shown on the project plans or directed by the Engineer, in conformance with the Contractor's Storm Water Pollution Prevention Plan will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

The contract price paid per square meter for temporary soil stabilizer shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary soil stabilizer, complete in place, including furnishing and applying bonded fiber matrix as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary soil stabilizer required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary soil stabilizer.

10-1.06 TEMPORARY COVER

Temporary cover shall be furnished, installed, maintained, and later removed in conformance with the details as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions. Temporary cover used to cover materials other than exposed soil shall not be allowed unless approved in advance by the Engineer.

The Contractor shall use temporary cover as one of the various measures to prevent water pollution. The Storm Water Pollution Control program shall include the use of temporary cover.

MATERIALS

Temporary Cover Fabric

Temporary cover fabric shall be either a geomembrane (plastic sheeting) or a geotextile (engineering fabric) conforming to one of the following requirements:

- A. Geotextile shall be a woven, slit film fabric which is also known as woven tape. The fabric shall be non-biodegradable, resistant to deterioration by sunlight, and inert to most soil chemicals. Edges of the film fabric shall be selvage or serge to prevent unraveling. The film fabric shall also conform to the following requirements:

Specification	Requirements
Grab tensile strength (25-mm grip), kilonewtons, minimum ASTM Designation: D4632*	0.89
Elongation at break, percent, minimum ASTM Designation: D4632*	15
Toughness, kilonewtons, minimum (percent elongation x grab tensile strength)	13.3
Permittivity, 1/sec, maximum, (liters per minute per square meter) ASTM Designation: D 4491	0.08 (244)
Ultraviolet light stability, percent tensile strength retained after 500 hours, minimum ASTM Designation: D 4355 (xenon arc lamp method)	70

* or appropriate test method for specific polymer

- B. Geomembrane shall consist of 0.25-mm thick, single-ply material in conformance with the requirements in ASTM Designation: D 5199.

Temporary cover fabric shall be manufactured from polyethelene or polypropylene, or comparable polymers. The polymer materials may be virgin, recycled, or a combination of virgin and recycled materials. The polymer materials shall not contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance with the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Restrainers

Restrainers for securing the temporary cover fabric on slopes and stockpiles shall consist of one or a combination of the following:

- A. Gravel-filled bags used as restrainers shall be knotted, roped, and placed at a maximum of 2 m apart on the temporary cover fabric as shown on the plans. Gravel-filled bags shall be between 13 kg and 22 kg in mass, between 600 mm and 800 mm in length, and between 400 mm and 500 mm in width. Gravel bag fabric shall be

non-woven polypropylene geotextile with a minimum unit weight of 235 g/m². The fabric shall have a minimum grab tensile strength (25-mm grip) of 0.89-kN in conformance with the requirements in ASTM Designation: D 4632, and an ultraviolet (UV) stability of 70 percent tensile strength retained after 500 hours in conformance to the requirements in ASTM Designation: D 4355, xenon arc lamp method. Gravel shall consist of non-cohesive material between 5 mm and 75 mm in diameter, free of clay balls, organic matter, and other deleterious material. The openings of filled gravel bags shall be secured to prevent escape of gravel.

- B. Restrainers consisting of a steel anchor with a wooden lath shall be fabricated and placed as shown on the plans. Wooden lath shall conform to the provisions in Section 20-2.12, "Lumber," of the Standard Specifications and shall be fir or pine, 38 mm x 89 mm in size, and 2.4 m in length. The wooden lath shall be secured to the temporary cover with steel anchors placed 1.2 m apart along the lath.

The Contractor may use an alternative restrainer if approved by the Engineer in writing. The Contractor shall submit details for an alternative restrainer to the Engineer prior to installation. The alternative restrainer shall be installed and maintained in conformance with these special provisions.

INSTALLATION

Temporary cover shall be installed as follows:

- A. Temporary cover fabric shall be placed and anchored as shown on the plans.
- B. Abutting edges of the temporary cover fabric shall overlap a minimum of 0.6-m. Non-abutting edges shall be embedded in the soil a minimum of 150 mm.
- C. Restrainers shall be placed at the overlap area and along the toe of the slope. Restrainers outside the overlap areas shall be placed at a maximum spacing of 2.4 m.
- D. Steel anchors shall be installed to allow the leg of the steel anchor to pierce through the temporary cover fabric into the slope with the crown section securing the wooden lath firmly against the slope.
- E. Earthen berm, a linear sediment barrier, shall be constructed adjacent to the toe of the slope with a minimum height of 200 mm and a minimum width of 940 mm. The earthen berms shall be hand or mechanically compacted. Alternative linear sediment barrier may be used at the Contractor's expense if approved by the Engineer in writing .

If the Contractor removes the temporary cover in order to facilitate other work, the temporary cover shall be replaced and secured by the Contractor at the Contractor's expense.

When no longer required as determined by the Engineer, temporary cover shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

MAINTENANCE

The Contractor shall maintain the temporary cover throughout the contract to prevent displacement or migration of the material on the slope or stockpiled.

Temporary cover shall be maintained to minimize exposure of the protected area. Restrainers shall be relocated and secured as needed to restrain the temporary cover fabric in place. Temporary cover that breaks free shall be immediately secured. Holes, tears, and voids in the temporary cover fabric shall be patched, repaired, or replaced. When patches or repairs are unacceptable as determined by the Engineer, the temporary cover shall be replaced.

MEASUREMENT AND PAYMENT

Temporary cover will be measured by the square meter along the slope.

The contract price paid per square meter for temporary cover shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing, maintaining, and removing the temporary cover, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The cost of maintaining the temporary cover will be borne equally by the State and the Contractor.

The division of cost will be made by determining the cost of maintaining temporary cover in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Clean-up, repair, removal, disposal, replacement because of improper installation, and replacement of temporary cover damaged as a result of the Contractor's negligence will not be considered as included in the cost for performing maintenance.

10-1.07 TEMPORARY CONCRETE WASHOUT FACILITY

Temporary concrete washout facilities shall be constructed, maintained, and later removed in conformance with the details as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions.

Temporary concrete washout facilities shall be used as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall include the use of temporary concrete washout facilities.

MATERIALS

Plastic Liner

Plastic liner shall be single ply, new polyethylene sheeting, a minimum of 0.25-mm thick and shall be free of holes, punctures, tears or other defects that compromise the impermeability of the material. Plastic liner shall not have seams or overlapping joints.

Gravel-filled Bags

Gravel-filled bag fabric shall be non-woven polypropylene geotextile (or comparable polymer), with a minimum unit weight of 235 g/m². The fabric shall have a minimum grab tensile strength of 0.89-kilonewtons in conformance to the requirements in ASTM Designation: D 4632, 25-mm grip, and an ultraviolet (UV) stability of 70 percent tensile strength retained after 500 hours in conformance to the requirements in ASTM Designation: D 4355, xenon arc lamp method.

Gravel-filled bags shall be between 600 mm and 800 mm in length, and between 400 mm and 500 mm in width.

Gravel shall be between 5 mm and 75 mm in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be secured such that gravel does not escape. Gravel-filled bags shall be between 13 kg and 22 kg in mass.

Straw Bales

Straw for straw bales shall conform to the provisions in Section 20-2.06, "Straw," of the Standard Specifications.

Straw bales shall be a minimum of 360 mm in width, 450 mm in height, 900 mm in length and shall have a minimum mass of 23 kg. The straw bale shall be composed entirely of vegetative matter, except for binding material.

Straw bales shall be bound by either wire, nylon or polypropylene string. Jute or cotton binding shall not be used. Wire shall be a minimum 1.57 mm (16-gage) baling wire. Nylon or polypropylene string shall be approximately 2 mm in diameter with 360 N of breaking strength.

Stakes

Stakes shall be 50 mm x 50 mm wood posts. Metal stakes may be used as an alternative, and shall be a minimum 13 mm in diameter. Stakes shall be a minimum 1200 mm in length. The tops of the metal stakes shall be bent at a 90-degree angle or capped with an orange or red plastic safety cap that fits snugly to the metal stake. The Contractor shall submit a sample of the metal stake and plastic cap, if used, to the Engineer prior to installation.

Staples

Staples shall be as shown on the plans.

Signs

Signs shall be constructed as shown on the plans. Wood posts shall conform to the provisions in Section 56-2.02B, "Wood Posts," of the Standard Specifications. Lag screws shall conform to the provisions in Section 56-2.02D, "Sign Panel Fastening Hardware," of the Standard Specifications.

Plywood shall be freshly painted for each installation with not less than 2 applications of flat white paint. Sign letters shown on the plans shall be stenciled with commercial quality exterior black paint. Testing of paint will not be required.

INSTALLATION

Temporary concrete washout facilities shall be installed on grade or below grade as shown on the plans and as follows:

- A. Temporary concrete washout facilities shall be installed prior to beginning placement of concrete and located a minimum of 15 m from storm drain inlets, open drainage facilities, and water courses unless determined infeasible by the Engineer. Temporary concrete washout facilities shall be located away from construction traffic or access areas at a location determined by the Contractor and approved by the Engineer.

- B. A sign shall be installed adjacent to each washout facility at a location determined by the Contractor and approved by the Engineer. Signs shall be installed in conformance with the provisions in Section 56-2.03, "Construction," and Section 56-2.04, "Sign Panel Installation," of the Standard Specifications and as shown on the plans.
- C. The length and width of a temporary concrete washout facility may be increased from the minimum dimensions shown on the plans, at the Contractor's expense and upon approval of the Engineer.
- D. Temporary concrete washout facilities shall be constructed in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations for all concrete wastes. These facilities shall be constructed to contain all liquid and concrete waste without seepage, spillage or overflow.
- E. Berms for below grade temporary concrete washout facilities shall be constructed from compacted native material. Gravel may be used in conjunction with compacted native material

The Contractor may use an alternative temporary concrete washout facility if approved by the Engineer in writing. The Contractor shall submit details for an alternative temporary concrete washout facility to the Engineer at least 7 days prior to installation. Any increase in cost, including maintenance costs, for the alternative temporary concrete washout facility shall be borne by the Contractor. The alternative temporary concrete washout facility shall be installed and maintained in conformance with these special provisions.

When temporary concrete washout facilities are no longer required for the work, as determined by the Engineer, the hardened concrete and liquid residue shall be removed and disposed of in conformance with the provisions in Section 15-3.02, "Removal Methods," of the Standard Specifications. Material used to construct temporary concrete washout facilities shall become the property of the Contractor, shall be removed from the site of the work, and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Holes, depressions or other ground disturbance caused by the installation and removal of the temporary concrete washout facilities shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MAINTENANCE

Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 300 mm. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with the provisions in Section 15-3.02, "Removal Methods," of the Standard Specifications. Holes, rips, and voids in the plastic liner shall be patched and repaired by taping or the plastic liner shall be replaced. Plastic liner shall be replaced when patches or repairs compromise the impermeability of the material as determined by the Engineer.

PAYMENT

The contract unit price paid for temporary concrete washout facilities shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing temporary concrete washout facilities, complete in place, including maintenance, removal of materials, and backfilling and repairing holes, depressions and other ground disturbance, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.08 TEMPORARY SILT FENCE

Temporary silt fence shall be furnished, installed, maintained, and later removed in conformance with the details as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions. Temporary silt fence is used as a temporary linear barrier for sediment control.

The Contractor shall use temporary silt fence as one of the various measures to prevent water pollution. The Storm Water Pollution Control program shall include the use of temporary silt fence.

MATERIALS

Temporary silt fence shall be either prefabricated or consist of separate components of silt fence fabric, posts, and fasteners.

Silt Fence Fabric

Silt fence fabric shall be geotextile manufactured from woven polypropylene or polymer material. Silt Fence Fabric may be virgin or recycled, or a combination of virgin and recycled polymer materials. No virgin or recycled polymer

materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance to the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Silt fence fabric shall conform to the following requirements:

Specification	Requirements
Width, mm, minimum.	900
Grab tensile strength (25 mm grip), kilonewtons, minimum in each direction ASTM Designation: D 4632	0.45
Elongation, percent, minimum in each direction ASTM Designation: D 4632 (25 mm grip)	15
Ultraviolet stability, percent tensile strength retained after 500 hours, minimum ASTM Designation: D 4355 (xenon-arc lamp and water spray weathering device)	70

Posts

Posts for temporary silt fence shall be one of the following:

- A. Posts shall be fir or pine, a minimum 34 mm x 40 mm in size, and 1.2 m in length. One end of the post shall be pointed. Wood preservative treatment will not be required for wood posts.
- B. Posts shall be steel and have a "U", "T", "L" or other cross sectional shape that can resist failure by lateral loads. The steel posts shall have a minimum mass per length of 1.1 kg/m and a minimum length of 1.2 m. One end of the steel posts shall be pointed and the other end shall be capped with an orange or red plastic safety cap which fits snugly to the steel post. The Contractor shall submit to the Engineer for approval a sample of the capped steel post prior to installation.

Fasteners

Fasteners for attaching silt fence fabric to posts shall be as follows:

- A. When prefabricated silt fence is used, posts shall be inserted into sewn pockets.
- B. Silt fence fabric shall be attached to wooden posts with nails or staples as shown on the plans or as recommended by the manufacturer or supplier. Tie wire or locking plastic fasteners shall be used to fasten the silt fence fabric to steel posts. Maximum spacing of fasteners shall be 200 mm along the length of the steel post.

INSTALLATION

Temporary silt fence shall be installed parallel with the slope contour in reaches not to exceed 150 m. A reach is considered a continuous run of temporary silt fence from end to end or from an end to an opening, including joined panels. Each reach shall be constructed so that the elevation at the base of the fence does not deviate from the contour more than one third of the fence height.

The silt fence fabric shall be installed on the side of the posts facing the slope. The silt fence fabric shall be anchored in a trench as shown on the plans. The trench shall be backfilled and mechanically or hand tamped to secure the silt fence fabric in the bottom of the trench.

Mechanically pushing 300 mm of the silt fence fabric vertically through the soil may be allowed if the Contractor can demonstrate to the Engineer that the silt fence fabric will not be damaged and will not slip out of the soil, resulting in sediment passing under the silt fence fabric.

At the option of the Contractor, the maximum post spacing may increase to 3 m if the fence is reinforced by a wire or plastic material by prefabrication or by field installation. The field-assembled reinforced temporary silt fence shall be able to retain saturated sediment without collapsing.

Temporary silt fence shall be joined as shown on the plans. The tops of the posts shall be tied together by minimum of 2 wraps of tie wire of a minimum 1.5 mm diameter. The silt fence fabric shall be attached to the posts at the joint as specified in these special provisions.

Temporary silt fence shall be repaired or replaced at the expense of the Contractor on the same day when the damage occurs.

When no longer required as determined by the Engineer, temporary silt fence shall be removed from the site of the work. Trimming the silt fence fabric and leaving it in place will not be allowed.

Holes, depressions or any other ground disturbance caused by the removal of the temporary silt fence shall be backfilled and repaired in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MAINTENANCE

Temporary silt fence shall be maintained to provide a sediment holding capacity of approximately one-third the height of the silt fence fabric above ground. When sediment exceeds this height, or when directed by the Engineer, sediment shall be removed. The removed sediment shall be deposited within the project limits in such a way that the sediment is not subject to erosion by wind or by water.

MEASUREMENT AND PAYMENT

The quantity of temporary silt fence will be measured by the meter as determined from actual measurements, the measurements to be made parallel with the ground slope along the line of the completed temporary silt fence, deducting the widths of openings.

The contract price paid per meter for temporary silt fence shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary silt fence, complete in place, including trench excavation and backfill, and removal of temporary silt fence, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The cost for maintaining the temporary silt fence will be borne equally by the State and the Contractor.

The division of cost will be made by determining the cost of maintaining temporary silt fence in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Clean-up, repair, removal, disposal, and replacement due to improper installation, and replacement of temporary silt fence damaged as a result of the Contractor's negligence will not be considered as included in the cost of maintaining temporary silt fence.

10-1.09 TEMPORARY FENCE AND GATE

Temporary fence and gate shall be furnished, constructed, maintained, and later removed as shown on the plans, as specified in these special provisions and as directed by the Engineer.

The fence and gate shall conform to the requirements in "Chain Link Fence and Gate (Type CL-2.4, Black Vinyl-Clad)" of these special provisions.

Temporary fence and gate that is damaged during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

When no longer required for the work, as determined by the Engineer, temporary fence and gate shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work, except as otherwise provided in this section.

Removed temporary fence and gate materials that are not damaged may be constructed in the permanent work provided the materials conform to the requirements specified for the permanent work and such materials are new when used for the temporary fence.

Holes caused by the removal of temporary fence shall be backfilled in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

The temporary fence and gate will be measured and paid for in the same manner specified for permanent fence of similar character as provided in Section 80, "Fences," of the Standard Specifications.

Full compensation for maintaining, removing, and disposing of temporary fence shall be considered as included in the contract prices paid per meter for the various types of temporary fence and no additional compensation will be allowed therefor.

10-1.10 TEMPORARY CONSTRUCTION ENTRANCE

Temporary construction entrance shall be constructed, maintained, and later removed in conformance with the details as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Attention is directed to "Water Pollution Control" of these special provisions. Temporary construction entrance is used as a temporary sediment tracking control.

The Contractor shall use temporary construction entrance as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall include the use of temporary construction entrance.

At the option of the Contractor, temporary construction entrance shall be either Type 1 or Type 2 .

MATERIALS

Temporary Entrance Fabric

Temporary entrance fabric shall be manufactured from polyester, nylon or polypropylene material or any combination thereof. Temporary entrance fabric shall be a nonwoven, needle-punched fabric, free of any needles which may have broken off during the manufacturing process. Temporary entrance fabric shall be permeable and shall not act as a wicking agent.

Temporary entrance fabric shall be manufactured from virgin or recycled, or a combination of virgin and recycled, polymer materials. No virgin or recycled materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance to the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Temporary entrance fabric shall conform to the following requirements:

Specification	Requirements
Mass per unit area, grams per square meter, minimum ASTM Designation: D 5261	235
Grab tensile strength (25-mm grip), kilonewtons, minimum ASTM Designation: D4632*	0.89
Elongation at break, percent, minimum, ASTM Designation: D4632*	50
Toughness, kilonewtons, minimum (percent elongation x grab tensile strength)	53

* or appropriate test method for specific polymer

Rocks

Rocks shall be angular to subangular in shape, and shall conform to the material quality requirements in Section 72-2.02, "Materials," of the Standard Specifications for apparent specific gravity, absorption, and durability index. Rocks used for the temporary entrance shall conform to the following sizes:

Square Screen Size (mm)	Percentage Passing
150	100
75	0-20

Corrugated Steel Panels

Corrugated steel panels shall be prefabricated and shall be pressed or shop welded as shown on the plans, with a slot or hooked section to facilitate coupling at the ends of the panels.

INSTALLATION

Temporary construction entrance shall be installed as follows:

- A. Prior to placing the temporary entrance fabric, the areas shall be cleared of all trash and debris. Vegetation shall be removed to the ground level. Trash, debris, and removed vegetation shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way", of the Standard Specifications.
- B. A sump shall be constructed within 6 m of each temporary construction entrance as shown on the plans. The exact location of the sump will be determined by the Engineer.
- C. Before placing the temporary entrance fabric, the ground shall be graded to a uniform plane. The relative compaction of the top 0.5-m shall be not less than 90 percent. The ground surface shall be free of sharp objects that may damage the temporary entrance fabric, and shall be graded to drain to the sump as shown on the plans.
- D. Temporary entrance fabric shall be positioned longitudinally along the alignment of the entrance, as directed by the Engineer.
- E. The adjacent ends of the fabric shall be overlapped a minimum length of 300 mm.
- F. Rocks to be placed directly over the fabric shall be spread in the direction of traffic, longitudinally and along the alignment of the temporary construction entrance.

- G. During spreading of the rocks, vehicles or equipment shall not be driven directly on the fabric. A layer of rocks of minimum 150 mm thick shall be placed between the fabric and the spreading equipment to prevent damage to the fabric.
- H. For Type 2 temporary construction entrance, a minimum of 6 coupled panel sections shall be installed for each temporary construction entrance. Prior to installing the panels, the ground surface shall be cleared of all debris to ensure uniform contact with the ground surface.

Fabric damaged during rock placement shall be repaired by placing a new piece of fabric over the damaged area. The piece of fabric shall be large enough to cover the damaged area and provide a minimum 450-mm overlap on all edges.

The Contractor may use an alternative temporary construction entrance if approved by the Engineer in writing. The Contractor shall submit details for an alternative temporary construction entrance to the Engineer at least 7 days prior to installation. The alternative temporary construction entrance shall be installed and maintained in conformance with these special provisions.

If buildup of soil and sediment deter the function of the temporary construction entrance, the Contractor shall immediately remove and dispose of the soil and sediment, and install additional corrugated steel panels and spread additional rocks to increase the capacity of the temporary construction entrance at the Contractor's expenses.

When the temporary construction entrances are no longer required, rocks, temporary entrance fabric, soil and collected sediment shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Corrugated steel panels used in the construction of temporary construction entrance shall become the property of the Contractor.

Holes, depressions or other ground disturbance caused by the removal of the temporary construction entrance, including the sumps, shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

While the temporary construction entrance are in use, pavement shall be cleaned and sediment removed at least once a day, and as often as necessary when directed by the Engineer. Soil and sediment or other extraneous material tracked onto existing pavement shall not be allowed to enter drainage facilities.

MAINTENANCE

The Contractor shall maintain temporary construction entrance throughout the contract or until removed. The Contractor shall prevent displacement or migration of the rock surfacing or corrugated steel panels. Any significant depressions resulted from settlement or heavy equipment shall be repaired by the Contractor, as directed by the Engineer.

Temporary construction entrance shall be maintained to minimize tracking of soil and sediment onto existing public roads.

MEASUREMENT AND PAYMENT

The quantity of temporary construction entrance will be measured and paid for as units determined from actual count in place.

The contract unit price paid for temporary construction entrance shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing and removing the temporary construction entrance, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The cost of maintaining the temporary construction entrance will be borne equally by the State and the Contractor.

The division of cost will be made by determining the cost of maintaining temporary construction entrance in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications and paying to the Contractor one-half of that cost. Clean-up, repair, removal, disposal, replacement because of improper installation, and replacement of temporary construction entrance damaged as a result of the Contractor's negligence will not be considered as included in the cost for performing maintenance.

10-1.11 COOPERATION

Attention is directed to Section 7-1.14, "Cooperation," and Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

Furthermore, the Contractor's attention is directed to Areas for Contractor's Use, as shown on the plans, and as specified in "Areas for Contractor's Use," of these special provisions and as directed by the Engineer.

It is anticipated that work by other contractors may be in progress adjacent to or within the limits of this project during progress of the work on this contract. The Contractor shall be responsible for coordinating with other contractors performing work within these contract limits.

Contracts which may be in progress during the working period of this contract, include, but are not necessarily limited to the following:

1. Contract No. 04-012024 constructing San Francisco-Oakland Bay Bridge structures, Route 80, in the City and County of San Francisco and Alameda County, between KP 1.6 (PM 1.0) and KP 1.6 (PM 1.0).
2. Contract No. 04-0120C4 constructing Pier W2 foundation of Main Span Bridge structures, in the City and County of San Francisco, on Route 80, at Yerba Buena Island at KP 13.2 (PM 8.2)
3. Contract No. 04-0120E4 constructing Piers E2 and T1 foundations of Main Span Bridge structures, in the City and County of San Francisco, on Route 80, at Yerba Buena Island at KP 13.4 (PM 8.3) and at KP 13.8 (PM 8.6)
4. Contract No. 04-0120F4 constructing Self-Anchored Suspension Bridge Superstructure, in the City and County of San Francisco, on Route 80, between Yerba Buena Island at KP 13.2 (PM 8.2) and the west end of Contract 04-012024 at KP 13.9 (PM 8.7)
5. Contract No. 04-0120G4 providing San Francisco-Oakland viaduct retrofit, demolition of the existing Substation and garage, and construction of the new substation and garage, in the City and County of San Francisco, on Route 80, at Yerba Buena Island, between KP 12.6 (PM 7.8) and KP 12.8 (PM 7.9)
6. Contract No. 04-0120P4 reconstructing YBI Structures in the City and County of San Francisco, on Route 80, at Yerba Buena Island, between KP 12.6 (PM 7.8) and KP 13.2 (PM 8.2)
7. Contract No. 04-0120R4 constructing the Temporary Bypass Structures Route 80 (South-South Detour) in the City and County of San Francisco, at Yerba Buena Island, between KP 12.6 (PM 7.8) and KP 13.2 (PM 8.2).
8. Contract No. 04-012044 constructing San Francisco-Oakland Bay Bridge approach structure and roadway on Route 80, between the east end of Contract 04-012024 at KP 1.6 (PM 1.0) and San Francisco-Oakland Toll Plaza at KP 3.2 (PM 2.0).
9. Contract No. 04-002974 constructing Toll Operation Building, and ramps, at the south side of the San Francisco-Oakland Toll Plaza, on Route 80, between KP 1.6 (PM 1.0) and KP 3.7 (PM 2.3), in Alameda County.
10. Contract No. 04-014004 constructing Maintenance Buildings and Maintenance roadway access and reconstructing ramps, on Route 80, between KP 1.6 (PM 1.0) and San Francisco-Oakland Toll Plaza at KP 3.7 (PM 2.3), in Alameda County.
11. Contract No. 04-0435V4 providing Seismic Retrofit by Replacement, on Route 80 from West Anchorage San Francisco-Oakland Bay Bridge at KP 7.9 (PM 4.9) to 5th Street On/Off-Ramps at KP 9.5 (PM 5.9), in the City and County of San Francisco.
12. Contract 04-0435C4 providing Seismic Retrofit and Archeology Investigation, on Route 80, on Route 80 from West Anchorage San Francisco-Oakland Bay Bridge at KP 7.9 (PM 4.9) to 5th Street On/Off-Ramps at KP 9.5 (PM 5.9), in the City and County of San Francisco.
13. Contract No. 04-043554 providing Seismic Retrofit, on Route 80 from 0.2 Mile East of San Francisco Anchorage San Francisco-Oakland Bay Bridge at PM 5.8 (KP 9.3) to Yerba Buena Anchorage San Francisco-Oakland Bay Bridge at PM 7.6 (KP 12.2), in the City and County of San Francisco.
14. Contract No. 04-0435U4 providing Seismic Retrofit, on Route 80 from 0.2 Mile West of San Francisco Anchorage San Francisco-Oakland Bay Bridge at PM 5.5 (KP 8.9) to East End of Yerba Buena Tunnel at PM 7.8 (KP 12.6), in the City and County of San Francisco.

Progress schedules for the above contracts, when available, may be inspected by the Contractor, such progress schedules are tentative and no guarantee can be made by the State that such work will actually be performed as indicated by the schedules.

Furthermore, the Contractor shall be responsible for coordinating with other contractors, agencies or their authorized personnel or representative performing work within these contract limits. It includes:

Work by State forces will be in progress within the contract limits during the working period of this contract.

Work by the City and County of San Francisco forces of Hetch Hetchy and Power will be at Sanitary Sewer Lift Pump Station, which is located within the contract limits during the working period of this contract.

10-1.12 PROGRESS SCHEDULE (CRITICAL PATH METHOD)

The Contractor shall submit to the Engineer practicable critical path method (CPM) progress schedules in conformance with these special provisions. Whenever the term "schedule" is used in this section it shall mean CPM progress schedule.

The provisions in Section 8-1.04, "Progress Schedule," of the Standard Specifications shall not apply.

DEFINITIONS

The following definitions shall apply to this section:

- A. **ACTIVITY.**—A task, event or other project element on a schedule that contributes to completing the project. Activities have a description, start date, finish date, duration and one or more logic ties.
- B. **BASELINE SCHEDULE.**—The initial schedule representing the Contractor's work plan on the first working day of the project.
- C. **CONTRACT COMPLETION DATE.**—The current extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer in conformance with the provisions in Section 8-1.06, "Time of Completion," of the Standard Specifications.
- D. **CRITICAL PATH.**—The longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path will extend the scheduled completion date.
- E. **CRITICAL PATH METHOD (CPM).**—A network based planning technique using activity durations and the relationships between activities to mathematically calculate a schedule for the entire project.
- F. **DATA DATE.**—The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."
- G. **FLOAT.**—The difference between the earliest and latest allowable start or finish times for an activity.
- H. **MILESTONE.**—An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.
- I. **NEAR CRITICAL PATH.**—A chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.
- J. **SCHEDULED COMPLETION DATE.**—The planned project finish date shown on the current accepted schedule.
- K. **TOTAL FLOAT.**—The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.
- L. **UPDATE SCHEDULE.**—A current schedule developed from the baseline or subsequent schedule through regular monthly review to incorporate as-built progress and any planned changes.

GENERAL REQUIREMENTS

The Contractor shall submit to the Engineer baseline, monthly update and final update schedules, each consistent in all respects with the time and order of work requirements of the contract. The project work shall be executed in the sequence indicated on the current accepted schedule.

Schedules shall show the order in which the Contractor proposes to carry out the work with logical links between time-scaled work activities, and calculations made using the critical path method to determine the controlling operation or operations. The Contractor is responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

The Contractor shall produce schedules using computer software and shall furnish compatible software for the Engineer's exclusive possession and use. The Contractor shall furnish network diagrams and schedule data as parts of each schedule submittal.

Schedules shall include, but not be limited to, applicable activities that show the following:

- A. Project characteristics, salient features, or interfaces, including those with outside entities, that could affect time of completion.
- B. Project start date, scheduled completion date and other milestones.
- C. Work performed by the Contractor, subcontractors and suppliers.
- D. Submittal development, delivery, review and approval, including those from the Contractor, subcontractors and suppliers.
- E. Procurement, delivery, installation and testing of materials, plants and equipment.
- F. Testing and settlement periods.
- G. Utility notification and relocation.
- H. Erection and removal of falsework and shoring.
- I. Major traffic stage switches.
- J. Finishing roadway and final cleanup.

Schedule activities shall include the following:

- A. A clear and legible description.
- B. Start and finish dates.
- C. A duration of not less than one working day, except for event activities, and not more than 20 working days, unless otherwise authorized by the Engineer.
- D. At least one predecessor and one successor activity, except for project start and finish milestones.

E. Required constraints.

The Engineer's review and acceptance of schedules shall not waive any contract requirements and shall not relieve the Contractor of any obligation thereunder or responsibility for submitting complete and accurate information. Schedules that are rejected shall be corrected by the Contractor and resubmitted to the Engineer within 5 working days of notification by the Engineer, at which time a new review period of one week will begin.

Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Engineer, either the Contractor or the Engineer discover that any aspect of the schedule has an error or omission, it shall be corrected by the Contractor on the next update schedule.

PRECONSTRUCTION SCHEDULING CONFERENCE

The Engineer will schedule and conduct a Preconstruction Scheduling Conference with the Contractor's Project Manager and Construction Scheduler within seven days after the bidder has received the contract for execution. At this meeting, the requirements of this section of the special provisions will be reviewed with the Contractor. The Contractor shall be prepared to discuss its schedule methodology, proposed sequence of operations, the activity identification system for labeling all work activities, the schedule file numbering system, and any deviations it proposes to make from the Stage Construction Plans. The Engineer will submit a scheduling shell project on electronic medium, displaying an activity code dictionary consisting of fields populated with the Caltrans scheduling codes, filters, layouts, report formats, contract milestones, and a resource dictionary. The Contractor shall utilize these codes, filters, layouts, etc. and may add other codes as necessary, to group and organize the work activities. Periodically the Engineer may request the Contractor to utilize additional filters, layouts or activity codes to be able to further group or summarize work activities.

Also, the Engineer and the Contractor shall review the requirements for all submittals applicable to the contract and discuss their respective preparation and review durations. All submittals and reviews are to be reflected on the Interim Baseline Schedule and the Baseline Schedule.

COMPUTER SOFTWARE

The Contractor shall submit to the Engineer for approval a description of proposed software before delivery. The software shall be the current version of Primavera SureTrak Project Manager for Windows, or equal, and shall be compatible with Windows NT (version 4.0) operating system. If software other than SureTrak is proposed, it shall be capable of generating files that can be imported into SureTrak.

The Contractor shall furnish schedule software and all original software instruction manuals to the Engineer with submittal of the baseline schedule. The schedule software will be returned to the Contractor within 4 weeks of submittal of the final update schedule. The State will compensate the Contractor in conformance with the provisions in Section 4-1.03, "Extra Work," of the Standard Specifications for replacement of software which is damaged, lost or stolen after delivery to the Engineer.

NETWORK DIAGRAMS, REPORTS AND DATA

The Contractor shall include the following for each schedule submittal:

- A. Two sets of originally plotted, time-scaled network diagrams.
- B. One 1.44-megabyte 90 mm floppy diskette containing the schedule data.

The time-scaled network diagrams shall conform to the following:

- A. Show a continuous flow of information from left to right.
- B. Be based on early start and early finish dates of activities.
- C. Clearly show the primary paths of criticality using graphical presentation.
- D. Be prepared on B-size sheets, 280 mm x 430 mm, or larger size.
- E. Include a title block and a timeline on each page.

INTERIM BASELINE SCHEDULE

Within 15 days after approval of the contract, the Contractor shall submit to the Engineer an Interim Baseline Project Schedule which will serve as the progress schedule for the first 120 days of the project, or until the Baseline Schedule is accepted, whichever is sooner. The Interim Baseline Schedule shall utilize the critical path method of scheduling. The Interim Baseline Schedule shall depict how the Contractor plans to perform the work for the first 120 days of the contract.

Additionally, the Interim Baseline Schedule shall show all required submittals working drawings, and review periods, and shall provide for all permits, and other non-work activities necessary to begin the work. The Contractor shall also submit a Summary Schedule, reflecting the duration of the contract, grouped by major areas of the project identified by the scheduling codes provided in the Caltrans scheduling codes or as defined by the Engineer. This summary schedule is for information purposes only and is to be used as a reference until the Baseline Schedule is accepted.

The Interim Baseline Schedule submittal shall include the data files used to generate the schedule on electronic medium.

The Engineer shall be allowed 10 days to review the schedule and to provide comments, including the Contractor's application of the supplied activity codes. All comments are to be implemented into the Baseline Schedule. Re-submittal of the Interim Baseline Schedule is not required. Late review of the Interim Baseline Schedule shall not restrain the submittal of the Baseline Schedule. No contract payments shall be made to the Contractor until a Interim Baseline Schedule is submitted in accordance with the above requirements.

BASELINE SCHEDULE

The Contractor shall submit to the Engineer a baseline schedule within 20 working days of approval of the contract. The Contractor shall allow 3 weeks for the Engineer's review after the baseline schedule and all support data are submitted.

The baseline schedule shall include the entire scope of work and shall show how the Contractor plans to complete all work contemplated. The baseline schedule shall show the activities that define the critical path. Multiple critical paths and near-critical paths shall be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities shall be critical or near critical, unless otherwise authorized by the Engineer.

The baseline schedule shall not extend beyond the number of working days originally provided in these special provisions. The baseline schedule shall have a data date of the first working day of the contract and not include any completed work to date. The baseline schedule shall not attribute negative float or negative lag to any activity.

UPDATE SCHEDULE

The Contractor shall submit an update schedule and meet with the Engineer to review contract progress, on or before the first day of each month, beginning one month after the baseline schedule is accepted. The Contractor shall allow 2 weeks for the Engineer's review after the update schedule and all support data are submitted, except that the review period shall not start until any previous month's required schedule is accepted. Update schedules that are not accepted or rejected within the review period will be considered accepted by the Engineer.

The update schedule shall have a data date of the twenty-first day of the month or other date established by the Engineer. The update schedule shall show the status of work actually completed to date and the work yet to be performed as planned. In addition, the update schedule shall show any proposed schedule modifications including adding or deleting activities or changing activity constraints, durations or logic. The Contractor shall state in writing the reasons for any changes to activities and the critical path that result in a delay to the scheduled completion date compared to the previous accepted schedule.

WEEKLY SCHEDULE MEETINGS

The Engineer and the Contractor shall hold weekly scheduling meetings to discuss the near term schedule activities, to address any long-term schedule issues, and to discuss any relevant technical issues. The Contractor shall develop a rolling 4-weeks schedule identifying the previous week worked and a 3-week look ahead. It shall provide sufficient detail to include the actual and planned activities of the Contractor and all the subcontractors for offsite and construction activities, addressing all activities to be performed and to identify issues requiring engineering action or input.

Each activity in the 4 week rolling schedule should be identified by an associated CPM schedule activity ID numbering system. This schedule should not be hand written. The Contractor shall utilize a schedule layout as acceptable by the Engineer. The schedule shall be electronically submitted to the Engineer one day prior to the scheduled meeting date.

FINAL UPDATE SCHEDULE

The Contractor shall submit a final update, as-built schedule with actual start and finish dates for the activities, within 30 days after completion of contract work. The Contractor shall provide a written certificate with this submittal signed by the Contractor's project manager and an officer of the company stating, "To my knowledge and belief, the enclosed final update schedule reflects the actual start and finish dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

RETENTION

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during each estimate period in which the Contractor fails to submit an acceptable schedule conforming to the requirements of these

special provisions as determined by the Engineer. Schedule retentions will be released for payment on the next monthly estimate for partial payment following the date that acceptable schedules are submitted to the Engineer or as otherwise specified herein. Upon completion of all contract work and submittal of the final update schedule and certification, any remaining retained funds associated with this section, "Progress Schedule (Critical Path Method)", will be released for payment. Retentions held in conformance with this section shall be in addition to other retentions provided for in the contract. No interest will be due the Contractor on retention amounts.

PAYMENT

Full compensation for the required schedules and software shall be considered as included in the contract prices paid for the various items of work involved, and no additional compensation will be allowed therefor.

10-1.13 TIME-RELATED OVERHEAD

The Contractor will be compensated for time-related overhead in conformance with these special provisions.

Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages," "Force Account Payment," and "Progress Schedule (Critical Path Method)" of these special provisions.

The provisions in Section 9-1.08, "Adjustment of Overhead Costs," of the Standard Specifications shall not apply.

Time-related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work. Time-related overhead shall not include costs that are not related to time, including but not limited to, mobilization, licenses, permits, and other charges incurred only once during the contract.

Field office overhead expenses include time-related costs associated with the normal and recurring operations of the construction project, and shall not include costs directly attributable to the work of the contract. Time-related costs of field office overhead include, but are not limited to, salaries, benefits, and equipment costs of project managers, general superintendents, field office managers and other field office staff assigned to the project, and rent, utilities, maintenance, security, supplies, and equipment costs of the project field office.

Home office overhead or general and administrative expenses refer to the fixed costs of operating the Contractor's business. These costs include, but are not limited to, general administration, insurance, personnel and subcontract administration, purchasing, accounting, and project engineering and estimating. Home office overhead costs shall exclude expenses specifically related to other contracts or other businesses of the Contractor, equipment coordination, material deliveries, and consultant and legal fees.

The quantity of time-related overhead associated with a reduction in contract time for cost reduction incentive proposals accepted and executed in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications shall be considered a construction cost attributable to the resultant estimated net savings due to the cost reduction incentive.

If the final increased quantity of time-related overhead exceeds 149 percent of the number of working days specified in the Engineer's Estimate, the Contractor shall, within 60 days of the Engineer's written request, submit to the Engineer an audit examination and report performed by an independent Certified Public Accountant of the Contractor's actual overhead costs. The independent Certified Public Accountant's audit examination shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude unallowable costs as determined in the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31. The audit examination and report shall determine if the rates of field office overhead and home office overhead are:

- A. Allowable in conformance with the requirements of the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31.
- B. Adequately supported by reliable documentation.
- C. Related solely to the project under examination.

Within 20 days of the Engineer's written request, the Contractor shall make its financial records available for audit by the State for the purpose of verifying the actual rate of time-related overhead specified in the audit submitted by the Contractor. The actual rate of time-related overhead specified in the audit, submitted by the Contractor, will be subject to approval by the Engineer.

If the Engineer requests the independent Certified Public Accountant audit, or if it is requested in writing by the Contractor, the contract item payment rate for time-related overhead, in excess of 149 percent of the number of working days specified in the Engineer's Estimate, will be adjusted to reflect the actual rate.

The cost of performing an independent Certified Public Accountant audit examination and submitting the report, requested by the Engineer, will be borne equally by the State and the Contractor. The division of the cost will be made by determining the cost of providing an audit examination and report in conformance with the provisions of Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost. The cost of performing an audit examination and submitting the independent Certified Public Accountant audit report for overhead claims other than for the purpose of verifying the actual rate of time-related overhead shall be entirely borne by the Contractor.

The quantity of time-related overhead to be paid will be measured by the working day, designated in the Engineer's Estimate as WDAY. The estimated number of working days is the number of working days, excluding days for plant establishment, as specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions. The quantity of time-related overhead will be increased or decreased only as a result of suspensions or adjustments of contract time which revise the current contract completion date, and which satisfy any of the following criteria:

- A. Suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:
 - 1. Suspensions ordered due to weather conditions being unfavorable for the suitable prosecution of the controlling operation or operations.
 - 2. Suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform the provisions of the contract.
 - 3. Other suspensions mutually agreed upon between the Engineer and the Contractor.
- B. Extensions of contract time granted by the State in conformance with the provisions in the fifth paragraph in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.
- C. Reductions in contract time set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.

In the event an early completion progress schedule, as defined in "Progress Schedule (Critical Path Method)" of these special provisions, is submitted by the Contractor and approved by the Engineer, the amount of time-related overhead eligible for payment will be based on the total number of working days for the project, in conformance with the provisions in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, rather than the Contractor's early completion progress schedule.

The contract price paid per working day for time-related overhead shall include full compensation for time-related overhead, including the Contractor's share of costs of the independent Certified Public Accountant audit of overhead costs requested by the Engineer, as specified in these special provisions, and as directed by the Engineer.

The provisions in Sections 4-1.03B, "Increased or Decreased Quantities," and 4-1.03C, "Changes in Character of the Work," of the Standard Specifications shall not apply to the contract item of time-related overhead.

Full compensation for additional overhead costs incurred during days of inclement weather when the contract work is extended into additional construction seasons due to delays caused by the State shall be considered as included in the time-related overhead paid during the contract working days, and no additional compensation will be allowed therefor.

Full compensation for additional overhead costs involved in performing additional contract item work that is not a controlling operation shall be considered as included in the contract items of work involved and no additional compensation will be allowed therefor.

Full compensation for overhead, other than time-related overhead measured and paid for as specified above, and other than overhead costs included in the markups specified in "Force Account Payment" of these special provisions, shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

Overhead costs incurred by joint venture partners, subcontractors, suppliers or other parties associated with the Contractor shall be considered as included in the various overhead costs for which the Contractor is compensated, and no additional compensation will be allowed therefor.

For the purpose of making partial payments pursuant to the provisions in Section 9-1.06, "Partial Payments," of the Standard Specifications, the number of working days to be paid for time-related overhead in each monthly partial payment will be the number of working days, specified above to be measured for payment that occurred during that monthly estimate period, including compensable suspensions and right of way delays. Working days granted by contract change order due to extra work or changes in character of the work, will be paid for upon completion of the contract. The amount earned per working day for time-related overhead shall be the lesser of the following amounts:

- A) The contract item price.
- B) Twenty percent of the original total contract amount divided by the number of working days specified in "Beginning of Work, Time of Completion and Liquidated Damages," of these special provisions.

After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount of the total contract item price for time-related overhead not yet paid, will be included for payment in the first estimate made after acceptance of the contract in conformance with the provisions in Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

10-1.14 OBSTRUCTIONS

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444
	1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133
	1-800-227-2600

Attention is directed to Section 9-1.03B, "Work Performed by Special Forces or Others Special Services," of the Standard Specifications, regarding works to be performed by the San Francisco Public Utilities Commission/Water Department (SFWD) and Hetch-Hetchy Water & Power.

The San Francisco Public Utilities Commission/Water Department (SFWD), and Hetch-Hetchy Water & Power will work from 7:00 a.m. to 3:30 p.m., Monday through Friday.

The Contractor shall coordinate with SFWD, when installing the water mains, as shown on the plans and as directed by the Engineer. The Contractor shall make the necessary arrangements with the SFWD, through the Engineer, and shall submit a schedule of work, verified by a representative of the SFWD, to the Engineer. The schedule of work shall provide not less than the following number of working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications for the SFWD to complete their work:

Utility	Work Performed by the SFWD	Working Days
Water Main	Making a connection to an existing main	5
	Chlorination including laboratory results	5
	Service change over services larger than 50-mm (per each service)	5
	Service change over services less than 50 mm (for up to 6 services)	1
	Excavation Safety Plans review	15

The Contractor shall notify in writing the Engineer and SFWD, at least 21 working days in advance before any work to be performed by SFWD forces for disconnecting, and connecting of the water main, and disinfection. Furthermore, the Contractor shall confirm the scheduled work with the Engineer, and SFWD at (415) 550-4956, at least 7 working days before the actual field work by SFWD.

The Contractor shall coordinate with Hetch-Hetchy Water & Power, through the Engineer, when disconnecting and connecting any electrical facilities and as directed by the Engineer. The Contractor shall make the necessary arrangements with the Hetch-Hetchy Water & Power, through the Engineer, and shall submit a schedule of work, verified by a

representative of Hetch-Hetchy Water & Power, to the Engineer. The schedule of work shall provide not less than the following number of working days, as defined in these special provisions for the Hetch-Hetchy Water & Power to complete their work:

Utility	Work Performed by Hetch-Hetchy Water & Power	Working Days
Electrical Utility Facilities	Making a disconnection service	3
	Making aconnection service	1

The Contractor shall notify in writing the Engineer and HHW&P, at least 21 working days in advance before any work to be performed by HHW&P forces for disconnecting and connecting of electrical facilities. Furthermore, the Contractor shall confirm the scheduled work with the Engineer and HHW&P at (415) 274-0333, at least 7 working days before the actual field work by HHW&P.

Full compensation for coordination with SFWD and HHW&P shall be considered as included in the contract prices paid for various items of work and no separate payment will be made therefor.

In the event that the utility facilities work mentioned above are not performed, installed, removed or relocated by the date specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities work not being performed, installed, removed or relocated by the date specified, the State will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

The existing sanitary sewer lift pump station, including pump station, underground vault and sanitary main system, will remain in service for the duration of this contract. The Contractor shall notify the Engineer and City and County of San Francisco Public Utilities Commission at (415) 648-6882 x 1290, at least 10 working days before excavation and piling work is begun. The Contractor shall field verify the location of the cable and ensure that the monitoring cable shall not be damaged.

Full compensation for protecting the existing sanitary sewer lift pump station, including pump station, underground vault and sanitary main system, shall be considered as included in the contract prices paid for various items of work and no separate payment will be made therefor.

10-1.15 ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY

Attention is directed to Sections 5-1.10, "Equipment and Plants," and 7-1.01A(3), "Payroll Records," of the Standard Specifications, and these special provisions.

The Contractor shall submit to the Engineer a list of each piece of equipment and its identifying number, type, make, model and rate code in accordance with the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rate" which is in effect on the date the work is performed, and the names, labor rates and work classifications for all field personnel employed by the Contractor and all subcontractors in connection with the public work, together with such additional information as is identified below. This information shall be updated and submitted to the Engineer weekly through the life of the project.

This personnel information will only be used for this mobile daily diary computer system and it will not relieve the Contractor and subcontractors from the payroll records requirements as required by Section 7-1.01A(3), "Payroll Records," of the Standard Specifications.

The Contractor shall provide the personnel and equipment information not later than 11 days after the contract award for its own personnel and equipment, and not later than 5 days before start of work by any subcontractor for the labor and equipment data of that subcontractor.

The minimum data to be furnished shall comply with the following specifications:

DATA CONTENT REQUIREMENTS.

- A. The Contractor shall provide the following basic information for itself and for each subcontractor that will be used on the contract:

Caltrans contract ID	Alphanumeric; up to 15 characters.
Company name.	Alphanumeric; up to 30 characters.
Federal tax ID	Alphanumeric; up to 10 characters.
State contractor license	Alphanumeric; up to 20 characters.
Company type (prime or sub)	Alphanumeric; up to 10 characters.
Address (line 1).	Alphanumeric; up to 30 characters.
Address (line 2).	Alphanumeric; up to 30 characters.
Address (city).	Alphanumeric; up to 30 chars.
Address (2-letter state code).	Alphanumeric; up to 2 characters.
Address (zip code)	Alphanumeric; up to 14 characters.
Contact FirstName.	Alphanumeric; up to 15 characters
Contact LastName	Alphanumeric; up to 20 characters
Telephone number (with area code).	Alphanumeric; up to 20 characters.
Company code: short company name.	Alphanumeric; up to 10 characters.
Type of work (Department-supplied codes)	Alphanumeric; up to 30 characters
DBE status (Department-supplied codes)	Alphanumeric; up to 20 characters.
Ethnicity for DBE status (Department-supplied codes).	Alphanumeric; up to 20 characters.
List of laborers to be used on this contract (detail specified below).	
List of equipment to be used on this contract (detail specified below).	

For example, one such set of information for a company might be:

04-072359
XYZ CONSTRUCTION, INC.
94-2991040
AL1649T
SUB
1240 9TH STREET
SUITE 600
OAKLAND
CA
94612
JOHN
SMITH
(510) 834-9999
XYZ
PAVING
MBE
BLACK

B. The Contractor shall provide the following information for each laborer who will be used on the contract:

Caltrans contract ID	Alphanumeric; up to 15 characters.
Company code (as defined above).	Alphanumeric; up to 10 characters.
Employee ID	Alphanumeric; up to 10 characters.
Last name.	Alphanumeric; up to 20 characters.
First name.	Alphanumeric; up to 15 characters.
Middle name.	Alphanumeric; up to 15 characters.
Suffix	Alphanumeric; up to 15 characters.
Labor trade (Department-provided codes).	Alphanumeric; up to 10 characters.
Labor classification (Department-provided codes).	Alphanumeric; up to 10 characters.
Regular hourly rate.	Alphanumeric; up to (6,2)
Overtime hourly rate.	Alphanumeric; up to (6,2)
Doubletime hourly rate	Alphanumeric; up to (6,2)
Standby hourly rate.	Alphanumeric; up to (6,2)
Ethnicity (Department-provided codes).	Alphanumeric; up to 20 characters.
Gender.	Alphanumeric; up to 1 characters.

For example, one such set of information might be:

04-072359
 XYZ
 1249
 GONZALEZ
 HECTOR
 VINCENT
 JR.
 OPR
 JNY
 12.50
 18.75
 25.00
 0.00
 HISPANIC
 M

C. The Contractor shall provide the following information for each piece of equipment that will be used on the contract:

Caltrans contract ID	Alphanumeric; up to 15 characters.
Company code (as defined above).	Alphanumeric; up to 10 characters.
Company's equipment ID number.	Alphanumeric; up to 10 characters.
Company's equipment description.	Alphanumeric; up to 60 characters.
Equipment type (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment make (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment model (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment rate code (from Department ratebook).	Alphanumeric; up to 10 characters
Regular hourly rate.	Alphanumeric; up to (6,2)
Overtime hourly rate.	Alphanumeric; up to (6,2)
Standby hourly rate	Alphanumeric; up to (6,2)
Idle hourly rate.	Alphanumeric; up to (6,2)
Rental flag.	Alphanumeric; up to 1 character.

For example, one such set of information might be:

04-072359
XYZ
B043
CAT TRACTOR D-6C
TRACC
CAT
D-6C
3645
75.00
75.00
0.00
0.00
N

DATA DELIVERY REQUIREMENTS.

- A. All data described in "Data Requirements" of this section shall be delivered to the Department electronically, on 3 1/2" floppy disks compatible with the Microsoft Windows operating system. The Contractor shall provide a weekly disk and hard copy of the required correct updated personnel and equipment information for the Contractor and all the subcontractors and verified correct by the Engineer.
- B. Data of each type described in the previous section (contractor, labor, and equipment information) shall be delivered separately, each type in one or more files on floppy disk. Any given file may contain information from one contractor or from multiple contractors, but only one type of data (contractor, labor, or equipment information).
- C. The file format for all files delivered to Caltrans shall be standard comma-delimited, plain text files. This type of file (often called "CSV") is the most standard type for interchange of formatted data; it can be created and read by all desktop spreadsheet and desktop database applications. Characteristics of this type of file are:
 1. All data is in the form of plain ASCII characters.
 2. Each row of data (company, person, equipment) is delimited by a carriage return character.
 3. Within rows, each column (field) of data is delimited by a comma character.
- D. The files shall have the following columns (i.e., each row shall have the following fields):
 1. Contractor info: 17 columns (fields) as specified in "Data Requirements #1", above.
 2. Labor info: 15 columns (fields) as specified in "Data Requirements #2", above.
 3. Equipment info: 13 columns (fields) as specified in "Data Requirements #3", above.

For every one type of file, columns (fields) must be in the order specified under "Data Requirements", above. All columns (fields) described under "Data Requirements" must be present for all rows, even if some column (field) values are empty. The first row of each file must contain column headers (in plain text).

- E. Column (field) contents shall conform to the data type and length requirements described in the "Data Requirement" section, above. In addition, column (field) data must conform to the following restrictions:
1. All data shall be uppercase.
 2. Company type shall be either "PRIME" or "SUB".
 3. Labor trade and classification codes must conform to a list of standard codes that will be supplied by Department.
 4. Contractor type of work codes and DBE status codes must conform to a list of standard codes that will be supplied by Department.
 5. Ethnicity codes must conform to standard codes that will be supplied by Department.
 6. Data in the "gender" column must be either "M" or "F".
 7. Data in the "rental equipment" column must be either "Y" or "N".
 8. Equipment owner's description may not be omitted. (The description, together with the equipment number, is how the equipment will be identified in the field.) Include manufacturer, rated capacity & trade description.
 9. Equipment type, make, model, and ratebook code shall conform to the Department of Transportation Publication entitled "Labor Surcharge and Equipment Rental Rate", which is in effect on the date the work is performed. If the equipment in question does not have an entry in the book then alternate, descriptive entries may be made in these fields as directed by the Engineer.
- F. The name of each file shall indicate its contents, e.g., "labor.csv" for laborers, "equipment.csv" for equipment, and "contractor.csv" for contractors. Each floppy disk supplied to Caltrans must be accompanied by a printed list of the files it contains with a brief description of the contents of each file.

PAYMENT

The contract lump sum price paid for electronic mobile daily diary computer system data delivery shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in electronic mobile daily diary computer system data delivery as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The lump sum bid price for electronic mobile daily diary computer system data delivery will be made according to the following schedule:

The Contractor will receive not more than 20 per cent per month of the total bid price for electronic mobile daily diary computer system data delivery . After the completion of the work, 100 per cent payment will be made for electronic mobile daily diary computer system data delivery less the permanent deduction, if any, for failure to deliver complete weekly electronic mobile daily diary computer system data in each month.

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during the first estimate period in which the Contractor fails to submit electronic mobile daily diary computer system data delivery conforming to the requirements of this section, as determined by the Engineer. Thereafter, on subsequent successive estimate periods the percentage the Department will retain will be increased at the rate of 25 percent per estimate period in which acceptable electronic mobile daily diary computer system data have not been submitted to the Engineer. Retentions for failure to submit acceptable electronic mobile daily diary computer system data shall be additional to all other retentions provided for in the contract. The retention for failure to submit acceptable electronic mobile daily diary computer system data will be released for payment on the next monthly estimate for partial payment following the date that acceptable electronic mobile daily diary computer system data is submitted to the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of electronic mobile daily diary computer system data delivery. Adjustments in compensation for electronic mobile daily diary computer system data delivery will not be made for any increased or decreased work ordered by the Engineer in furnishing electronic mobile daily diary computer system data.

10-1.16 DUST CONTROL

Dust control shall conform to the provisions in Section 10, "Dust Control," of the Standard Specifications.

10-1.17 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.18 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Flagging, signs, and all other traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Category 1 traffic control devices are defined as those devices that are small and lightweight (less than 45 kg), and have been in common use for many years. The devices shall be known to be crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Engineer, the Contractor shall provide written self-certification for crashworthiness of Category 1 traffic control devices. Self-certification shall be provided by the manufacturer or Contractor and shall include the following: date, Federal Aid number (if applicable), expenditure authorization, district, county, route and kilometer post of project limits; company name of certifying vendor, street address, city, state and zip code; printed name, signature and title of certifying person; and an indication of which Category 1 traffic control devices will be used on the project. The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 traffic control devices are defined as those items that are small and lightweight (less than 45 kg), that are not expected to produce significant vehicular velocity change, but may otherwise be potentially hazardous. Category 2 traffic control devices include: barricades and portable sign supports.

Category 2 devices purchased on or after October 1, 2000 shall be on the Federal Highway Administration (FHWA) Acceptable Crashworthy Category 2 Hardware for Work Zones list. This list is maintained by FHWA and can be located at the following internet address: <http://safety.fhwa.dot.gov/fourthlevel/hardware/listing.cfm?code=workzone>. The Department maintains a secondary list at the following internet address: <http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf.htm>.

Category 2 devices that have not received FHWA acceptance, and were purchased before October 1, 2000, may continue to be used until they complete their useful service life or until January 1, 2003, whichever comes first. Category 2 devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer by the start of the project. The label shall be readable. After January 1, 2003, all Category 2 devices without a label shall not be used on the project.

If requested by the Engineer, the Contractor shall provide a written list of Category 2 devices to be used on the project at least 5 days prior to beginning any work using the devices. For each type of device, the list shall indicate the FHWA acceptance letter number and the name of the manufacturer.

Full compensation for providing self-certification for crashworthiness of Category 1 traffic control devices and for providing a list of Category 2 devices used on the project and labeling Category 2 devices as specified shall be considered as included in the prices paid for the various contract items of work requiring the use of the Category 1 or Category 2 traffic control devices and no additional compensation will be allowed therefor.

10-1.19 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Type II retroreflective sheeting shall not be used on construction area sign panels.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing excavation for construction area sign posts. The regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

The Contractor may be required to cover certain signs during the progress of the work. Signs that are no longer required or that convey inaccurate information to the public shall be immediately covered or removed, or the information shall be corrected. Covers for construction area signs shall be of sufficient size and density to completely block out the complete face of the signs. The retroreflective face of the covered signs shall not be visible either during the day or at night. Covers shall be fastened securely so that the signs remain covered during inclement weather. Covers shall be replaced when they no longer cover the signs properly.

10-1.20 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Lane closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic, except in the area proposed by the Contractor and approved by the Engineer.

Attention is directed to "Cooperation," of these special provisions.

The Contractor shall provide access and maintain Macalla Rd., and Torpedo Factory Rd., which are the primary access to United States Coast Guard (USCG), United States Navy facilities, University of California-Berkeley (UCB) Seismographic Stations, and other contractors to various project sites on Yerba Buena Island, in the vicinity of the contract, at all times.

Furthermore, the Contractor shall provide and maintain a 3.6 m lane access road to Sanitary Sewer Lift Pump Station, at all times. The Contractor shall submit a written request for an approval from San Francisco Public Utilities Commission through the Engineer at least 96 hours in advance for any construction operation that may block the access road to the sanitary sewer lift pump station.

Full compensation for providing and maintaining the above access shall be considered as included in the contract price paid for various items of work involved and no additional compensation will be allowed therefor.

The Contractor shall notify United States of Coast Guard Officer, at (415) 399-3504 of the Contractor's intent to begin work at least 10 working days before work is begun. The Contractor shall cooperate with United States of Coast Guard relative to handling traffic on Macalla Rd. leading to USCG access Rd., through the area and shall make arrangements relative to keeping the working area clear of parked vehicles.

A minimum of one paved traffic lane, not less than 3.3 m wide of USCG access Rd., at the south end limit of work, during the roadway and pile soldier wall construction, and at the north end limit of work, during the roadway construction, shall be open to traffic.

Attention is directed to the Contractor's access to and from the project site which may be limited by the closure of eastbound off-ramp (Right), westbound off-ramp connector to Hillcrest Rd, and Southgate Rd., under Contract 04-0120R4.

Attention is directed to "Bridge Tolls" of these special provisions. The access of the Contractor's trucks hauling material and surplus materials to and from the project site, from westbound Route 80, westbound and eastbound on-ramp to and from Treasure Island/Yerba Buena Island, shall not be allowed, during the peak periods from 5:00 a.m. to 10:00 a.m., and 3:00 p.m. to 7:00 p.m., on weekdays. Furthermore, the access of the Contractor's trucks hauling material and surplus materials to the project site from westbound Route 80 through the bus and carpool lanes, at San Francisco-Oakland Bay Bridge toll plaza, shall not be allowed.

Designated legal holidays are: January 1st, the last Monday in May, July 4th, the first Monday in September, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. Other modifications will be made by contract change order.

10-1.21 CLOSURE REQUIREMENTS AND CONDITIONS

Lane closures shall conform to the provisions in "Maintaining Traffic" of these special provisions and these special provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

CLOSURE SCHEDULE

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall use the Closure Schedule request forms furnished by the Engineer. Closure Schedules submitted to the Engineer with incomplete, unintelligible or inaccurate information will be returned for correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

COMPENSATION

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

10-1.22 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

One-way traffic shall be controlled on Macalla Rd. leading to USCG access Rd., through the project in conformance with the plan entitled "Traffic Control System for Lane Closure on Two Lane Conventional Highways" and these special provisions.

Additional advance flaggers will be required.

Utilizing a pilot car will be at the option of the Contractor. If the Contractor elects to use a pilot car, the cones shown along the centerline on the plan need not be placed. The pilot car shall have radio contact with personnel in the work area. The maximum speed of the pilot car through the traffic control zone shall be 40 kilometers per hour (25 mph).

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor (except for flagging costs), materials (including signs), tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system and for furnishing and operating the pilot car, (including driver, radios, other equipment, and labor required), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Flagging costs will be paid for as provided in Section 12-2.02, "Flagging Costs," of the Standard Specifications.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.23 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. On multilane roadways (freeways and expressways), edgeline delineation shall be provided at all times for traveled ways open to public traffic.

Work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE AND CENTERLINE DELINEATION

Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary raised pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary raised pavement markers placed on longitudinal intervals of not more than 7.3 m shall be used on lanes open to public traffic for a maximum of 14 days. Prior to the end of the 14 days, the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided at the Contractor's expense. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Where "no passing" centerline pavement delineation is obliterated, the following "no passing" zone signing shall be installed prior to opening the lanes to public traffic. C18 (ROAD CONSTRUCTION AHEAD) or C23 (ROAD WORK AHEAD) signs shall be installed from 300 m to 600 m ahead of "no passing" zones. R63 (DO NOT PASS) signs shall be installed at the beginning and at every 600-m interval within "no passing" zones. For continuous zones longer than 3 km, W71 (NEXT _____ MILES) signs shall be installed beneath the C18 or C23 signs installed ahead of "no passing" zones. R64 (PASS WITH CARE) signs shall be installed at the end of "no passing" zones. The exact location of "no passing" zone signing will be as determined by the Engineer and shall be maintained in place until permanent "no passing" centerline pavement delineation has been applied. The signing for "no passing" zones shall be removed when no longer required for the direction of public traffic. The signing for "no passing" zones shall conform to the provisions in "Construction Area Signs" of these special provisions, except for payment.

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers used for temporary laneline and centerline delineation (including the signing specified for "no passing" zones) and for providing equivalent patterns of permanent traffic lines for these areas when required shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

TEMPORARY EDGELINE DELINEATION

Whenever edgelines are obliterated on multilane roadways (freeways and expressways), the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 100-mm wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 m.

Traffic stripe (100-mm wide) placed for temporary edgeline delineation, which will require removal, shall consist of temporary removable construction grade striping and pavement marking tape listed in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Temporary removable construction grade striping and pavement marking tape when used shall be applied in conformance with the manufacturer's recommendations. Where removal of the 100-mm wide traffic stripe will not be required, painted traffic stripe used for temporary edgeline delineation shall conform to "Paint Traffic Stripes and Pavement Markings" of these special provisions, except for payment and the number of coats shall be, at the option of the Contractor, either one or 2 coats. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the project site to maintain the cones or delineators during hours of the day that the cones or delineators are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these special provisions, except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (900 mm) listed in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor. The quantity of channelizers used as temporary edgeline delineation will not be included in the quantity of channelizer (surface mounted) to be paid for.

10-1.24 CHANNELIZER

Channelizers shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Channelizers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

When no longer required for the work as determined by the Engineer, channelizers and underlying adhesive used to cement the channelizer bases to the pavement shall be removed. Removed channelizers and adhesive shall become the property of the Contractor and shall be removed from the site of work.

10-1.25 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these special provisions or where designated by the

Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety", "Order of Work", and "Temporary Railing" of these special provisions.

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or TrafFix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III and Fitch Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076. Telephone 1-312-467-6750, FAX 1-800-770-6755
 - 1. Distributor (North): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828. Telephone 1-800-884-8274, FAX 1-916-387-9734
 - 2. Distributor (South): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805. Telephone 1-800-222-8274, FAX 1-714-937-1070

- B. TrafFix Sand Barrels, manufactured by TrafFix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672. Telephone 1-949 361-5663, FAX 1-949 361-9205
 - 1. Distributor (North): United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112. Telephone 1-408 287-4303, FAX 1-408 287-1929
 - 2. Distributor (South): Statewide Safety & Sign, Inc., P.O. Box 1440, Pismo Beach, CA 93448. Telephone 1-800-559-7080, FAX 1-805 929-5786

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these special provisions will not be measured nor paid for.

10-1.26 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

REMOVE FIRE HYDRANT

Existing fire hydrants, at those locations shown on the plans to be removed, shall be removed. Holes at the existing locations shall be backfilled and graded to conform to adjacent conditions where necessary.

The contract unit price paid for remove fire hydrant shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in remove fire hydrant, complete, including removal, transportation and disposal of fire hydrant, related pipes, fittings, valves and accessories, and backfilling and grading the area to match existing conditions and to drain, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

ABANDON CULVERT

Existing culverts, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the pipelines shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with commercial quality concrete containing not less than 300 kg of cement per cubic meter.

Abandoning culverts in place shall conform to the following:

- A. Culverts that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
- B. Culverts 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.
- C. The ends of culverts shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Culverts shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended culverts abandonment.

Full compensation for concrete plugs, pipe removal, structure excavation, and backfill (including sand, controlled low strength material or slurry cement backfill) shall be considered as included in the contract unit price paid for abandon culvert and no additional compensation will be allowed therefore.

ABANDON SEWER

Existing sewers, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the sewers shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with commercial quality concrete containing not less than 300 kg of cement per cubic meter.

Abandoning sewers in place shall conform to the following:

- A. Sewers that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
- B. Sewers 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.
- C. The ends of sewers shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Sewers shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended sewers abandonment.

Full compensation for concrete plugs, pipe removal, structure excavation, and backfill (including sand, controlled low strength material or slurry cement backfill) shall be considered as included in the contract unit price paid for abandon sewer and no additional compensation will be allowed therefore.

ABANDON SEWER MANHOLE

Existing sewer manholes, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the sewer manholes shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with commercial quality concrete containing not less than 300 kg of cement per cubic meter.

Abandoning sewer manholes in place shall conform to the following:

- A. Sewer manholes that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
- B. Sewer manholes 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.
- C. The ends of sewer manholes shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Sewer manholes shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended sewer manholes abandonment.

Full compensation for concrete plugs, pipe removal, structure excavation, and backfill (including sand, controlled low strength material or slurry cement backfill) shall be considered as included in the contract unit price paid for abandon sewer manhole and no additional compensation will be allowed therefore.

REMOVE TRAFFIC STRIPE

Traffic stripe shall be removed at the locations shown on the plans and as directed by the Engineer. Attention is directed to "Water Pollution Control" of these special provisions.

REMOVE INLET

Existing inlets, where shown on the plans to be removed, shall be completely removed and disposed of.

REMOVE ASPHALT CONCRETE DIKE

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed.

Prior to removing the dike, the outside edge of the asphalt concrete to remain in place shall be cut on a neat line to a minimum depth of 50 mm.

The dike shall be removed in such a manner that the surfacing which is to remain in place is not damaged.

The dike shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

REMOVE ROADSIDE SIGN

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Sign panels shown on the plans shall be salvaged.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

Full compensation for salvaging sign panels shall be considered as included in the contract unit price paid for remove roadside sign and no separate payment will be made therefor.

REMOVE FENCE

Existing fence and gate at the locations shown on the plans, to be removed shall be removed and disposed of.

RESET ROADSIDE SIGN

Existing roadside signs, where shown on the plans to be reset, shall be removed and reset.

Each roadside sign shall be reset on the same day that the sign is removed.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

RELOCATE ROADSIDE SIGN

Existing roadside signs shall be removed and relocated to the new locations shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

RELOCATE USCG BUOY AND BELL

Existing USCG Buoy and Bell shown on plans to be relocated shall be relocated to a new location as shown on the plans. The exact location will be determined in the field by the Engineer. The buoy, the bell and related items removed from existing location, shall be stored temporarily at the USCG designated location on the USCG property until they are ready to be relocated at the new location.

The contract lump sum price paid for relocate USCG Buoy and Bell shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removal and reinstallation, complete in place and ready for use, including all site preparation, earthwork, and foundation work, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

ADJUST INLET

Existing concrete drainage inlets shall be adjusted as shown on the plans.

Portland cement concrete shall be minor concrete or may be produced from commercial quality concrete containing not less than 350 kilograms of cement per cubic meter.

Where inlets are located in areas to be paved or surfaced, no individual structure shall be constructed to final grade until the paving or surfacing has been completed immediately adjacent to the structure. Frames and grates shall be removed and reused in the work as shown on the plans.

MODIFY INLET WITH MANHOLE FRAME AND COVER

Existing concrete drainage inlets shall be modified with manhole frame and cover as shown on the plans.

Portland cement concrete shall be minor concrete or may be produced from commercial quality concrete containing not less than 350 kilograms of cement per cubic meter.

Where inlets are located in areas to be paved or surfaced, no individual structure shall be constructed to final grade until the paving or surfacing has been completed immediately adjacent to the structure.

Manhole Frames and Covers

Cast iron frames and covers shall be 610 mm inside diameter, full traffic type, as manufactured by Phoenix Iron Works, or approved equal as shown on the plans.

Each casting shall have its weight indicated thereon with white paint.

Care shall be exercised to cast the contact surfaces in a true plane and free from irregularities. These surfaces shall be machined or ground to insure uniform contact between frame and cover.

PAVEMENT

The contract unit price paid for modify inlet with manhole frame and cover shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in adjusting inlet, complete in place, including furnishing and installing manhole frame and cover, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

RECONSTRUCT MANHOLE

Existing manholes shall be reconstructed as shown on the plans.

Portland cement concrete shall be minor concrete or may be produced from commercial quality concrete containing not less than 350 kilograms of cement per cubic meter.

Where manholes are located in areas to be paved or surfaced, no individual structure shall be constructed to final grade until the paving or surfacing has been completed immediately adjacent to the structure. Frames and covers shall be removed and reused in the work as shown on the plans.

OBLITERATE SURFACING

Existing surfacing, when no longer required for the passage of public traffic, shall be obliterated at the locations shown on the plans.

Surfacing shall not be obliterated by the earth cover method.

Obliteration shall consist of rooting, plowing, pulverizing or scarifying the existing surfacing in conformance with the provisions in Section 15-2.02A, "Obliterating Roads and Detours," of the Standard Specifications.

COLD PLANE ASPHALT CONCRETE PAVEMENT

Existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 750 mm in width and shall be operated so that no fumes or smoke will be produced. The cold planing machine shall plane the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

The depth, width, and shape of the cut shall be as shown on the typical cross sections or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Planed widths of pavement shall be continuous except for intersections at cross streets where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 45 mm will not be allowed between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical: Horizontal) or flatter to the level of the planed area.

Asphalt concrete for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Operations shall be scheduled so that not more than 7 days shall elapse between the time when transverse joints are planed in the pavement at the conform lines and the permanent surfacing is placed at the conform lines.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Removal operations of cold planed material shall be concurrent with planing operations and follow within 15 m of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square meter. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

The contract price paid per square meter for cold plane asphalt concrete pavement shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cold planing asphalt concrete surfacing and disposing of planed material, including furnishing the asphalt concrete for and constructing, maintaining, removing, and disposing of temporary asphalt concrete tapers, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

REMOVE CONCRETE

Concrete, where shown on the plans to be removed, shall be removed.

The pay quantities of concrete to be removed will be measured by the cubic meter, measured before and during removal operations.

Concrete removed shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

10-1.27 DEMOLISH BUILDING

PART 1 – GENERAL

Scope.-This work shall consist of demolition, removal and disposal of Building No. 75 , including backfilling of resultant excavations and depressions, as shown on plans and as specified in the referenced sections of the Standard Specifications and these special provisions.

Attention is directed to "Removal and Disposal of Asbestos," of these special provisions regarding removal and disposal of the asbestos-containing materials.

Attention is directed to " Lead Abatement," of these special provisions regarding abatement of lead-containing materials.

Extent of demolition and disposal work shall include removal of all structures, sheds, foundations, footings, utilities, sidewalks, paved areas, curbs, gutters, and other structures from the building site up to the depth of one meter below ground surface.

Temporary facilities, such as fences, barricades, warning lights, and other temporary safety measures, are specified in Section 7, "Legal Relations and Responsibility," of the Standard Specifications.

Dust control is specified in Section 10, "Dust Control," of the Standard Specifications.

Removal of vegetation and trees is specified in Section 16, "Clearing and Grubbing," of the Standard Specifications.

SALE OF MATERIALS AND EQUIPMENT

All materials resulting from the demolition of improvements shall become the property of the Contractor. The Contractor shall remove said materials from the premises with his/her own organization. The Contractor shall not dispose of the improvements or material therefrom by sale, gift, or in any manner whatsoever to the general public at the site; provided however, that this provision shall not be construed as limits or prohibiting the sale or disposal of such improvements or materials at the site to duly licensed contractors or material men, provided that the materials are removed by the Contractor. Removal of buildings as unit, or in sections capable of reassembly as a structure, is expressly prohibited.

REFERENCES

The regulatory requirements which govern the work of this Section include the following governing Codes and Standards:

- A. American National Standards Institute (ANSI): ANSI A10.6 Safety Requirements for Demolition
- B. State of California, Department of Transportation (Caltrans), Standard Specifications, Section 15, Existing Highway Facilities.

REGULATORY REQUIREMENTS

In addition to the foregoing referenced standards, the regulatory requirements which govern the work of this Section include the following governing codes:

- A. California Code of Regulations (CCR), Title 8, Chapter 4, Subchapter 4 – Construction Safety Orders.
- B. California Code of Regulations (CCR), Title 24, Part 2, California Building Code, Chapter 33, "Site Work, Demolition and Construction."
- C. Regulation 11, Rule 2 of the Bay Area Air Quality Management District (BAAQMD).

PERMITS

The Contractor shall obtain all special permits and licenses and give all notices required for performance and completion of the demolition and removal work, hauling, and disposal of debris. Conform to the provisions of Section 7-1.04, "Permits and Licenses," of the Standard Specifications.

QUALITY CONTROL

Contractor Qualifications

- A. The Contractor or its subcontractor shall have, at time of the Contract Award and for the duration of the Contract, a valid, current C-21, Building Moving/Demolition Contractor license issued by the California Contractor's State License Board, for the type of work to be performed.

The Bid will be considered non-responsive unless the licensing requirements are met. An invalid license will result in cancellation of the award. Positive verification of a valid license issued by the California Contractor's State License Board will be performed by the Department.

- B. The Contractor must have a Division of Occupational Safety and Health (CAL-OSHA) permit(s) as outlined in the California Labor Code Sections 6500 and 6705, prior to the initiation of any practices, work method, operation, or process related to the demolition of any building, structure, falsework, or scaffold more than three stories high or the equivalent height 11.0-m; or, any construction or excavations of trenches which are 1.5-m or deeper.

SUBMITTALS

General.-Refer to "Working Drawings," of these special provisions, for general submittal requirements and procedures.

Demolition Plan.—Submit a comprehensive demolition plan, describing the proposed sequence, methods, and equipment for demolition, removal, and disposal of structure(s); include salvage if required. Do not proceed with demolition until the Engineer has given written approval of the demolition plan.

Permits.—Submit copies of demolition, hauling, and debris disposal permits and notices for record purposes. Include description of proposed haul routes.

Utility Severance Certificates.—Provide certificates, issued by the utility owners, of severance of utility services for record purposes.

Private Property Owner's Release.—If material demolished and removed from the site will be deposited on private property, submit two copies of written releases not more than 15 days before the start of work. Releases shall absolve the State from responsibility in connection with the depositing of material on private property, and shall be signed by the owners of such property on which the material will be deposited.

SITE CONDITIONS

General

Conform to the applicable provisions of Section 7, "Legal Relations and Responsibility," of the Standard Specifications for safety and health of persons; public safety; air pollution, water pollution, and sound control; and preservation of property.

The equipment and materials inside the buildings/structures will belong to the Contractor once the Contractor starts the demolition. This equipment shall not be sold on the Site.

Existing Building

Existing Building No. 75 is an Office/Warehouse Building.

Type of Building: Three story wood Structure.

Exterior wood siding, interior is finished with drywall, 0.60-m by 0.60-m suspended ceiling panels, wood fiber 25.4-mm by 25.4-mm ceiling tile, 305-mm by 305-mm floor tile, asbestos insulated pipes in the warehouse

Roof Covering: Pitched (sloped) with multiple layers of composition material

Approximate Age: 70 to 80 years

Basement: One

Total Building Area (Footprint): Approximately 378 square meters.

How Used: As a warehouse and office.

Contents: The building is empty.

Building Site (Plot) Area: Approximately 700 square meters.

Site Improvements: Green balcony support structure on ground floor, Trees, Concrete driveway ramp, Concrete Pads, Curbs, CL Fences around building, Stairway railing and concrete edges on the stairway from main floor to ground floor, Steps, Debris, Rubbish.

Site Topographic Conditions: Built on steep slope with concrete step footing.

Utilities Present: Water, Electricity and Telephone

Attention is directed to "Project Information," of the special provisions, regarding "Asbestos and Lead Survey Report" on the existing building.

A survey report of the existing building has been performed by an independent firm specializing in hazardous wastes to assess the presence of asbestos and lead.

There are asbestos materials on insulated pipes in the warehouse space on the ground floor, and asbestos containing materials and lead paint containing materials in the building.

Protection of Persons and Property

Install chain link fencing around the area of demolition work as specified in Section 80-4.01, "Chain Link Fence," of the Standard Specifications.

Erect and maintain temporary bracing, shoring, lights, barricades, signs, and other measures as necessary to protect the public, workers, and adjoining property from damage from demolition work, all in accordance with applicable codes and regulations.

Open depressions and excavations occurring as part of this work shall be barricaded and posted with warning lights when accessible through adjacent property or through public access. Conform to the provisions of Section 7-1.01E, "Trench Safety," of the Standard Specifications.

Operate warning lights during hours from dusk to dawn each day and as otherwise required.

Protect utilities, pavements, and facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by demolition operations.

Protect from weather at all times the salvageable materials and equipment and the interior of buildings to remain.

Protection of Utilities

Protect active sewer, water, gas, electric, and other utilities; and drainage and irrigation lines indicated or, when not indicated, found or otherwise made known to the Contractor before or during demolition work. If utility is damaged, immediately notify the utility owner for corrective action.

Arrange with and perform work required by utility companies and municipal departments for discontinuance or interruption of utility services due to demolition work.

Noise and Dust Abatement

Conform to the provisions of Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and the following:

- A. Provide continuous noise and dust abatement as required to prevent disturbance and nuisance to the public and workers and to the occupants of adjacent premises and surrounding areas. Dampen or cover areas affected by demolition operations as necessary to prevent dust nuisance.
- B. When a certain level of noise is unavoidable because of the nature of the work or equipment involved, and such noise is objectionable to the occupants of adjacent premises, make arrangements with the jurisdictional authorities to perform such work or operate such equipment at the most appropriate time periods of the day.
- C. Control the amount of dust resulting from demolition to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

Unknown Conditions

The Plans and related documents may not represent all surface conditions at the site and adjoining areas. The known surface conditions are as indicated, and shall be compared with actual conditions before commencement of work.

Existing utilities and drainage systems below grade are located from existing documents and from surface facilities such as manholes, valve boxes, area drains, and other such surface fixtures.

If existing active services encountered are not indicated or otherwise made known to the Contractor and interfere with the permanent facilities under construction, notify the Engineer in writing, requesting instructions on their disposition. Take immediate steps to ensure that the service provided is not interrupted, and do not proceed with the work until written instructions are received from the Engineer.

Thicknesses of existing pavements are from previous construction documents, and do not imply the actual depth or thickness of the total pavement or base material, where it occurs. Remove pavement of whatever thickness as required.

PART 2 – PRODUCTS

MATERIALS, EQUIPMENT, AND FACILITIES

The Contractor shall furnish all materials, tools, equipment, devices, appurtenances, facilities, and services as required for performing the demolition and removal work.

Materials used for backfill shall conform to the requirements for backfill of Section 19, "Earthwork," of the Standard Specifications, and these special provisions.

Materials forming portions of the structure indicated to be removed shall become the Contractor's property, and the Contractor shall be responsible for their removal from the site.

PART 3 – EXECUTION

PRESERVATION OF REFERENCE MARKERS

Record the locations and designation of survey markers and monuments prior to their removal. Provide three reference points for each survey marker and monument removed, established by a licensed civil engineer or land surveyor currently registered in the State of California.

Store removed markers and monuments during demolition work, and replace them upon completion of the work. Re-establish survey markers and monuments in conformance with the recorded reference points. Forward to the Engineer a letter verifying re-establishment of survey markers and monuments, signed by a licensed civil engineer or land surveyor currently registered in the State of California.

INSPECTION

Prior to starting demolition operations, perform a thorough inspection of the building and premises, and report to the Engineer any defects and structural weaknesses of existing construction and of improvements to remain.

Examine areas affected by the Work of this Section and verify the following conditions:

- A. Disconnection of utilities as required.
- B. That utilities serving occupied portions of adjacent or surrounding facilities will not be disturbed, except as otherwise indicated.

If unsatisfactory conditions exist, notify the Engineer, and do not begin demotion operations until such conditions have been corrected.

PREPARATION

The Contractor shall submit the notification of intent to demolish or renovate required by BAAQMD Regulation 11, Rule 2 at least 10 working days, as defined in Regulation 11, Rule 2, prior to beginning any demolition or asbestos removal as specified in "Removal and Disposal of Asbestos".

The limits of the site are shown on the plans. The Contractor shall confine its operations within the site limits indicated.

Lay out cutting work at the site and coordinate with related Work for which cutting is required.

Review the proposed layout with the Engineer prior to performing cutting operations.

Prior to beginning demolition work, make all arrangements with the serving utilities for disconnecting, removing, capping and plugging all utility services.

DEMOLITION

Use of explosives **will not** be permitted.

Operational Procedures and Methods

Perform demolition in accordance with the approved Demolition Plan. Perform demolition work in accordance with ANSI A10.6 and the California Code of Regulations, Title 8 and Title 24, as applicable.

Operational procedures shall be optional with the Contractor insofar as procedures do not infringe on the approved work schedule or salvage requirements. Conduct demolition and removal work in a manner which will minimize the spread of dust and flying particles.

Remove items indicated for demolition within the limits of the Work and as required to complete the Work of this Contract. Do not remove anything beyond the limits of Work indicated without prior written approval of the Engineer. If in doubt whether to remove an item, obtain written approval of the Engineer prior to proceeding.

Remove materials carefully, to the extent indicated and as required, providing for neat and orderly junctions between existing and new materials.

Protect existing structures, facilities, and landscaping from damage. Items damaged as a result of demolition operations shall be repaired or replaced, as required, at no increase in the Contract Price.

Perform work so as to provide the least interference and most protection to existing facilities and improvements to remain.

Demolish concrete and masonry in small sections. Perform demolition with small tools as much as possible.

Cap or plug utilities in accordance with the utility owner's standard details and instructions. Cap and plug pipe and other conduits abandoned due to demolition, with approved type caps and plugs as required by the utility owners.

Remove existing utilities as indicated. When utility lines are encountered that are not indicated on the plans, notify the Engineer prior to further work in that area.

Eliminate all sources of ignition prior to removal of the aboveground fuel oil tank and associated piping, including but not limited to welding, smoking, and electrical arcing. Do not allow any fuel from the tank or piping to discharge to the ground.

Backfill and compact depressions caused by excavations, demolition, and removal in accordance with "Earthwork," of these special provisions.

CUTTING

Cut new openings neat, as close as possible to profiles indicated.
Do not cut or alter structural members without the prior written approval of the Engineer.
Remove concrete and masonry whenever possible by saw cutting or similar approved method.

REMOVAL

Remove existing pavements, structures, and site improvements which interfere with new construction, where demolition is not indicated. Coordinate as required with the work of Section 16, "Clearing and Grubbing," of the Standard Specifications.

Remove walls and masonry construction to a minimum depth of 1 meter below existing ground level in areas where such items do not interfere with new construction.

Remove concrete and asphaltic concrete paving and slabs including aggregate base, as indicated, to a depth of 1 meter below existing adjacent or new finish grade, as applicable. Provide neat sawcuts at limits of pavement removal as indicated.

Slabs may be broken for drainage and left in place where they are below grade and are not detrimental to the structural integrity of the fill or structure to be placed above, as determined by the Engineer.

DISPOSAL OF REMOVED MATERIALS AND DEBRIS

Dispose of removed materials, waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction.

Burying of trash and debris on the site will not be permitted. Burning of trash and debris at the site will not be permitted.

Remove trash and debris from the site at frequent intervals so that their presence will not delay the progress of the work or cause hazardous conditions for workers and the public.

Removed materials, trash, and debris shall become the property of the Contractor and shall be removed from the site and disposed of in a legal manner. Location of disposal site and length of haul shall be the Contractor's responsibility.

RESTORATION OF EXISTING STRUCTURES AND FACILITIES

All damage to existing structures and facilities, which are to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of demolition and removal operations. The cost of repairing existing structures and facilities damaged by the Contractor's operations shall be at the Contractor's expense.

FIELD QUALITY CONTROL

Following performance of the Work, perform an inspection of the premises and report defects and structural weaknesses of structures partially demolished, cut, or removed; of adjacent structures; and of improvements remaining.

The Engineer will accompany the Contractor before and after performance of the Work to confirm the physical condition of the structures and improvements involved.

CLEAN UP

Remove debris and rubbish from basement and similar excavations. Remove and transport debris in a manner that prevents spillage on streets or adjacent areas. Comply with Local and State regulations regarding hauling and disposal of debris.

Prior to final inspection, thoroughly clean the entire site and put it into a clean and neat, acceptable condition. Remove from the site all construction waste and unused materials, dunnage, loose rock and stones, excess earth, and debris of any description resulting from the Work.

Hose down and scrub clean where necessary all pavement and paved walks.

Thoroughly remove mortar droppings from concrete slabs and pavement where they occur. Hose down and scrub clean all concrete flatwork and exposed vertical surfaces of concrete and masonry.

Free and clear all new and existing drainage systems.

Clean and protect all conduit openings.

PAYMENT

The contract lump sum price paid for demolish building shall include full compensation for furnishing all labor, materials, temporary facilities, such as warning lights, and other temporary safety measures, tools, equipment, and incidentals, and for performing all the work involved in demolition of site, site structures including utilities, building and building components, excavation and backfill, disposal of debris, and removal and disposal of asbestos and lead based paint complete, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for any incidental materials and labor, not shown on the plans or specified, which are necessary to complete the demolition work shall be considered as included in the contract lump sum price paid for demolish building and no additional compensation will be allowed therefor.

REMOVAL AND DISPOSAL OF ASBESTOS

PART 1.- GENERAL

SUMMARY

Scope.-This work shall consist of removing and disposing of hazardous or asbestos-related materials which are designated on the plans or specified in these special provisions to be removed and disposed of.

Regulated asbestos-containing material shall be removed prior to demolition, or other operations that would either break up, or preclude access to the regulated asbestos-containing material for subsequent removal. The regulated asbestos-containing material shall be removed, hauled and disposed of in accordance with all applicable Federal, State and local laws and ordinances.

Codes and standards.-Codes which govern removal and disposal of materials containing asbestos include, but are not necessarily limited to the following:

- A. California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control.
- B. California Code of Regulations, Title 22, Division 4, Chapter 30, "Minimum Standards for Management of Hazardous and Extremely Hazardous Material," latest revisions, as applicable.
- C. California Code of Regulations, Title 8, General Industry Safety Order 5208 Asbestos.
- D. Occupational Safety and Health Administration, Part 26 (amended), of Title 29 of the Code of Federal Regulations.
- E. Regulation 11, Rule 2 of the Bay Area Air Quality Management District (BAAQMD).

PART 2.- PRODUCTS (Not applicable)

PART 3.- EXECUTION

REMOVAL

Preparation.-Prior to performing operations involving the removal of hazardous waste containing asbestos, the Contractor shall provide written notification to the following agencies:

The Contractor shall submit the notification of intent to demolish or renovate required by BAAQMD Regulation 11, Rule 2 at least 10 working days prior to any renovation operation where the amount of regulated asbestos-containing is at least 30.8 linear meters, 9.4 square meters, or one cubic meter; and for all dry removals.www.baaqmd.gov

Bay Area Air Quality Management District (BAAQMD)
939 Ellis Street
San Francisco, CA 94109
Telephone No. (415)771-6000/749-4762

The Contractor shall notify the Division of Occupational Safety and Health (CAL OSHA) at least 24 hours prior to performing removal operations of materials containing asbestos.

Division of Occupational Safety and Health (CAL
OSHA)
455 Golden Gate Ave., Room 1524
San Francisco, CA 94102
Telephone No. (415) 703-5210
Fax No. : (415) 703-5231

The Contractor shall notify Division of Occupational Safety and Health (CAL OSHA) 24 hours prior to performing removal operations of materials containing asbestos.

The Contractor shall notify the Engineer 3 working days in advance of commencement of removal operations of material containing asbestos.

Handling.-The Contractor shall comply with all Federal, State, and local regulations for the removal of material containing asbestos prior to demolition, shall place such removed material in approved plastic containers (double ply, 0.15 mm minimum thickness, plastic bags) with caution labels affixed to said bags. Such caution labels shall have conspicuous, legible lettering which spells out the following, or equivalent warning:

CAUTION
CONTAINS ASBESTOS FIBERS
BREATHING ASBESTOS DUST MAY
CAUSE SERIOUS BODILY HARM

At the option of the Contractor, the removed materials containing asbestos may be placed directly into a roll off or drop box which shall have the same caution label affixed on all sides. Bulk friable asbestos-containing material that will not fit into containers without additional breaking shall be double-wrapped, sealed, and wetted. Trailers, drop-boxes, or other vehicles used for transport of bulk materials shall be lined with plastic sheeting and covered with a tarp.

The Contractor shall comply with all Federal, State and local requirements for safety which shall include, but not be limited to, providing employees with coveralls (preferably disposable plastic coated), rubber gloves (to be discarded after use), rubber boots (to be washed thoroughly after use), and respirators.

The Contractor shall be responsible for verifying that all employees, who are involved in asbestos removal operations, wear the protective devices enumerated herein during removal operations.

Transporting.-All haulers of hazardous waste material shall be currently registered with the State Department of Health Services (DOHS), and shall have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). All vehicles used to transport hazardous waste material shall have affixed to the vehicle a valid Certificate of Compliance issued by DOHS. If a roll off or drop box is utilized, both the drop box and the transporting vehicle must have a valid Certificate of Compliance issued by DOHS.

Disposal.-The Engineer will obtain the required EPA generator identification numbers, and will sign the hazardous waste manifests.

The Contractor shall dispose of all hazardous waste containing asbestos at a Class I, Class II-1, Class II-2, or Class 3 disposal site (old designation), or at a Class I, Class II, or Class 3 disposal site (new designation), which had previously agreed to accept the hazardous waste. The Contractor shall obtain verification that the disposal facility is currently certified and approved.

The Contractor shall notify the proper authorities at the disposal site in advance of delivery of hazardous waste containing asbestos to the disposal site.

PAYMENT

Full compensation for Removal and Disposal of Asbestos shall be considered as included in the contract lump sum price for demolish building and no separate payment will be made therefor.

LEAD ABATEMENT

PART 1.- GENERAL

SUMMARY

Scope.-The work shall consist of procedures for removal and disposal of lead based materials which are designated on the plans or specified in these special provisions to be removed and disposed of.

Where existing lead based materials are to be removed during demolition, construction or alterations, such material shall be treated as hazardous waste, and shall be removed, hauled and disposed of in accordance with all applicable Federal, State and local laws and ordinances.

SUBMITTALS

Health and safety.-A Code of Safe Practices, an Injury and Illness Prevention Program, and a Hazard Communication Program in accordance with the provisions of Construction Safety Orders 1509 and 1510 shall be submitted for approval.

QUALITY ASSURANCE

Codes and standards.-Codes which govern removal and disposal of materials containing lead include, but are not limited to the following:

- A. California Health and Safety Code, Division 20, Chapter 6.5, "Hazardous Waste Control Act."
- B. California Code of Regulations, Title 22, Division 4, Chapter 30, "Minimum Standards for Management of Hazardous and Extremely Hazardous Material."
- C. California Code of Regulations, Title 8, General Industry Safety Order, Section 1532.1, Lead.
- D. Occupational Safety and Health Administration, Part 26 (amended), of Title 29 of the Code of Federal Regulations.

Compliance program.-The Contractor shall submit the compliance programs required in subsection (e)(2), "Compliance Program," of said Section 1532.1, "Lead," to the Engineer for approval before starting removal work on the project and at such times when revisions to the program are ordered by the Engineer. The compliance programs shall be prepared by an industrial hygienist certified by the American Council of Industrial Hygiene. The Engineer will notify the Contractor of the approval or rejection of any submitted or revised compliance program in not more than 10 working days.

If measures being taken by the Contractor are inadequate to provide for worker safety and the containment and collection of residue from existing paint systems, the Engineer will direct the Contractor to revise his operations and the compliance program. Such directions will be in writing and will specify the items of work for which the Contractor's compliance programs are inadequate. No further work shall be performed on said items until the compliance programs are adequate and, if required, a revised compliance program has been approved.

The State will not be liable to the Contractor for failure to approve all or any portion of an originally submitted or revised compliance program for worker safety and the containment and collection of residue from existing paint systems, nor for any delays to the work due to the Contractor's failure to submit an acceptable compliance program.

Field sampling.-The Contractor shall furnish sampling and testing programs for air and soil as applicable. The programs shall be prepared and carried out by an industrial hygienist certified by the American Council of Industrial Hygiene. The number and location of the samples shall be designated by the Engineer.

Air samples, if required, shall be collected during removal operations to measure concentrations of heavy metals and total particulate matter in the ambient air as PM-10 (particulate matter with an aerodynamic diameter less than or equal to 10 micrometers). Air samples shall be collected and analyzed in accordance with the Code of Federal Regulations 40 CFR PART 50. Appendix J, except as follows:

- A. Air samples shall be Reference or Equivalent Method PM-10 Samplers as designated by the U. S. Environmental Agency and in accordance with requirements of 40 CFR PART 53.
- B. Sampling time each day shall coincide with the time of removal operations but the duration of sampling shall be not less than 8 hours.
- C. Immediately following analysis for PM-10, all samples will be analyzed for heavy metal content in accordance with 40 CFR PART 50, Appendix G.

A minimum of 4 soil samples shall be collected before start of work, which disturbs the existing paint system, and a minimum of 4 soil samples shall be collected within 36 hours following completion of the work which disturbs the existing paint system. A soil sample shall consist of 5 plugs, each 20 mm diameter and 15 mm deep, taken at each corner and center of a 0.30 meter square area. Soil samples shall be analyzed for total lead, total chromium and total zinc in accordance with Method 3050 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846" by the United States Environmental Protection Agency.

Sample analysis results shall be submitted in triplicate to the Engineer within 10 days after sampling. Sample analysis reports shall be prepared by the certified hygienist and include the following information:

- A. For both air and soil sample analysis results, the date and sample location of sample collection, sample number, contract number, and facility name as shown on the contract plans will be required.
- B. For air sample analysis results, the following will be required:

1. Start time, end time and duration of sample collection.
2. Start time and end times of cleaning on the day of sample collection.
3. Concentrations of PM-10 expressed as micrograms PM-10 per standard cubic meter of air.
4. Concentrations of heavy metals expressed as micrograms per standard cubic meter of air.

C. For soil sample analysis results, the concentrations of heavy metal expressed as parts million will be required.

PART 2.- PRODUCTS (Not applicable.)

PART 3.- EXECUTION

REMOVAL

Notification.-The Contractor shall notify the Engineer 3 working days in advance of commencement of removal operations of material containing lead or lead based materials.

Method of removal.-Painted materials shall be removed using the wet process removal equipment and methods, to a depth required to remove all paint and provide clean substrate suitable for a new finish.

Removed material and water used for removal shall be collected. Removed material shall be separated from water using approved filters.

Handling.-The Contractor shall comply with all Federal, State, and local regulations for the removal of material containing lead prior to demolition, shall place such removed material in approved containers with caution labels affixed. Such caution labels shall have conspicuous, legible lettering which spells out the following, or equivalent warning:

CAUTION CONTAINS LEAD

Temporary storage on the ground of material and residue produced when the existing paint system is disturbed will not be permitted. Material and residue shall be stored in leak proof containers and shall be handled in such a manner that no spillage will occur.

At the option of the Contractor, the removed lead based materials may be placed directly into a roll off or drop box which shall have the same caution label affixed on all side s.

Safety measures.--The Contractor shall comply with all Federal, State and local requirements for safety which shall include, but not be limited to, providing employees with coveralls (preferably disposable plastic coated), rubber gloves (to be discarded after use), rubber boots (to be washed thoroughly after use), and respirators.

The Contractor shall be responsible for verifying that all employees, who are involved in removal operations, wear the required protective devices during removal operations.

DISPOSAL

Transporting.--All haulers of hazardous waste material shall be currently registered with the State Department of Health Services (DOHS), and shall have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). All vehicles used to transport hazardous waste material shall have affixed to the vehicle a valid Certificate of Compliance issued by DOHS. If a roll off or drop box is utilized, both the drop box and the transporting vehicle must have a valid Certificate of Compliance issued by DOHS.

Disposal.-The Engineer will obtain the required EPA generator identification numbers, and will sign the hazardous waste manifests.

All material and residue produced during removal operations shall be tested and disposed of by the Contractor in California at an approved Class 1 disposal facility in accordance with the requirements of the disposal facility operator.

The Contractor shall notify the proper authorities at the disposal site in advance of delivery of hazardous waste containing lead to the disposal site.

PAYMENT

Full compensation for lead abatement shall be considered as included in the contract lump sum price for demolish building and no separate payment will be made therefor.

10-1.28 CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Attention is directed to "Environmental Work Restrictions," of these special provisions, regarding removal of vegetation and trees on YBI.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

The Contractor shall remove a tree from USCG parking lot as shown on the plans.

Existing vegetation outside the areas to be cleared and grubbed shall be protected from injury or damage resulting from the Contractor's operations. Existing vegetation and trees within the limits of the Environmentally Sensitive Areas (ESA), shall be protected throughout the duration of the Contract.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the roadway and parking lot as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

10-1.29 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Attention is directed to "Archaeological Study Area," of these special provisions

ROADWAY EXCAVATION

Excavation for the top 0.45-m of soil below the asphalt concrete pavement within the archaeological study area, as shown on the plans shall conform to Section 19-2, "Roadway Excavation," of the Standard Specifications and these special provisions.

Excavation below the depth of 0.45-m of soil below the asphalt concrete pavement for the archaeological study within the archaeological study area, as shown on the plans, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications and these special provisions.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

COMPACTION

Backfill within the archaeological study area and at the Building 75 location, as shown on the plans, shall conform to Section 19-6, "Embankment Construction," of these Standard Specifications, and these special provisions. Relative compaction of not less than 95 percent shall be obtained.

BACKFILL MATERIALS AT BUILDING No. 75

Materials used for backfilling the depressions site caused by excavations, demolition, and removal of the Building No. 75, as shown on the plans, and as directed by the Engineer, shall be the imported materials. The asphalt concrete materials removed from the existing pavement are not allowed to be used as backfill materials.

IMPORTED MATERIALS

Imported materials shall consist of clean soil and shall conform to the provisions in Section 19-7.02, "Imported Borrow," of the Standard Specifications and these special provisions.

Imported materials shall have a Resistance (R-Value) of not less than 25.

Imported borrow will be measured by the cubic meter placed and shall conform to the provisions in Section 19-7.04, "Measurement," of the Standard Specifications, and these special provisions.

Attention is directed to "Non-Storm Water Discharges" elsewhere in these special provisions.

Imported borrow will be measured and paid for by the cubic meter and the quantity to be paid for will be computed in the following manner:

- A. The total quantity of embankment will be computed in conformance with the provisions for roadway excavation in Section 19-2.08, "Measurement," of the Standard Specifications, on the basis of the planned or authorized cross section for embankments as shown on the plans and the measured ground surface.
- B. The Contractor, at the Contractor's option, may compact the ground surface on which embankment is to be constructed before placing any embankment thereon. If the compaction results in an average subsidence exceeding 75 mm, the ground surface will be measured after completion of the compaction. The Engineer shall be allowed the time necessary to complete the measurement of an area before placement of embankment is started in that area.
- C. The quantities of roadway excavation, structure excavation and ditch excavation, which have been used in the embankment, will be adjusted by multiplying by a grading factor to be determined in the field by the Engineer. No further adjustment will be made in the event that the grading factor determined by the Engineer does not equal the actual grading factor.
- D. The quantity of imported borrow to be paid for will be that quantity remaining after deducting the adjusted quantities of excavation from the total embankment quantity and then adding a quantity of 200 cubic meters for the anticipated effect of subsidence. No adjustment will be made in the event that the anticipated subsidence does not equal the actual subsidence.
- E. The Contractor may propose a plan whereby the Contractor would be paid on the basis of measured settlement in lieu of the allowance specified above. The proposal shall include complete details of the subsidence-measuring devices and a detailed plan of each installation. If the proposed plan is approved by the Engineer, the Contractor, at the Contractor's expense, shall provide, install and maintain the subsidence-measuring devices. The Engineer will take necessary readings to determine the progress of subsidence, if any, and the Contractor shall provide necessary assistance to make the readings.
- F. Installed devices which are determined by the Engineer to have been damaged will not be used for the determination of subsidence for the area the devices represent in the pattern of approved installations. The subsidence of the area represented by that installation shall be considered zero, regardless of the subsidence measured at other installations.
- G. The volumes required as a result of subsidence will be computed by the average-end-area method from the original measurements and the final measurements, including zero subsidence at all points and for all areas as provided herein. It shall be understood and agreed that the subsidence at the point of intersection of the side slopes (and end slopes at structures) with the ground line as established by the original cross sections shall be considered as zero. Unless otherwise agreed to by the Engineer, the subsidence shall be considered as zero at the points on the cross sections 15 m beyond the beginning and ending of the instrumented area. The computed volumes for such subsidence will be added to the quantities of embankment measured as specified herein.
- H. Detachable elements of the subsidence-measuring devices which can be salvaged without damage to the work shall remain the property of the Contractor and shall be removed from the highway right of way after final measurements are made.

HAZARDOUS MATERIAL EXCAVATION

Hazardous material excavation shall consist of excavating hazardous material and Class II material identified in the following table as being within excavation limits shown on the plans, specified in the Standard Specifications, or specified or directed by the Engineer and stockpiling and disposing of the material as specified in this section.

Locations	Classification	Vertical Limits (m)
M2 Line 12+15 to 13+47 (unpaved areas)	Hazardous	OG to 1.0 below OG
Drainage System No. 1, Unit i, j, k, l, m, n	Class II	Below elevation 1.5
Sanitary Sewer System No. 1, all units (unpaved areas)	Hazardous	OG to 1.0 below OG

Excavated hazardous material and Class II material shall be managed as follows:

- A. Hazardous material – Haul and dispose of the material at a permitted hazardous waste management facility in conformance with Section 2521 of Title 23 of the California Code of Regulations, Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, and these special provisions.
- B. Class II material – Haul and dispose of the material at a permitted Class II waste management facility in conformance with Section 20210 of Title 27 of the California Code of Regulations, Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, and these special provisions.

Hazardous materials shall be transferred directly from the excavation to a registered transport vehicle, a storage container approved for transport of hazardous waste by the United States Department of Transportation, or a stockpile

location approved by the Engineer. Class II material shall be transferred directly from the excavation to a transport vehicle, a storage container, or a stockpile location approved by the Engineer. Stockpile locations for Class II material shall be maintained in conformance with the provisions in "Water Pollution Control" of these special provisions. Stockpile locations for hazardous material shall be maintained as follows:

- A. The material shall not contain free liquids that separate readily from the material. The presence or absence of free liquids shall be demonstrated by United States Environmental Protection Agency Method 9095 as modified by Section 66264.314 of Title 22 of the California Code of Regulations.
- B. The material shall be stored on undamaged 1.5-mm high-density polyethylene or an equivalent impermeable barrier unless the stockpiling location is on a paved surface. If the location is on a paved surface the thickness of the barrier can be reduced to 0.5-mm high-density polyethylene or its equivalent. The dimensions of the barrier shall exceed the dimensions of the stockpile at all times. Any seams in the barrier shall be sealed to prevent leakage.
- C. At the end of each day or prior to a storm event the material shall be covered with undamaged 0.3-mm polyethylene or an equivalent impermeable barrier to prevent windblown dispersion and precipitation run-off and run-on. When more than one sheet is required to cover the material, the sheets shall be overlapped a minimum of 0.45-m in a manner that prevents water from flowing onto the material. The cover shall be secured in a manner that keeps it in place at all times. Driven anchors shall not be used except at the perimeter of the stockpile. The cover shall be inspected and maintained in conformance with the provisions in "Water Pollution Control" of these special provisions.

These stockpiling requirements apply to temporary storage outside of an excavation or a transport container including, but not limited to, staging of excavated material next to the excavation prior to pick up by loading equipment, accumulating material for full transport loads, and awaiting test results required by a disposal facility. The removal of hazardous material stockpiles shall begin within 90 days of accumulating 100 kg of hazardous material. After final removal has occurred the Contractor shall be responsible for any cleanup deemed necessary by the Engineer.

Hazardous material and Class II material on exteriors of transport vehicles shall be removed and placed either into the current transport vehicle or the excavation prior to the vehicle leaving the loading area. No hazardous material shall be deposited on public roads. The Contractor shall indemnify the State from any costs due to spillage during the transport of the hazardous material to the disposal facility.

Attention is directed to "Hazardous Material, General" of these special provisions.

SAMPLING AND ANALYSIS

The Contractor shall test the material to be excavated for any additional acceptance requirements of the disposal facility. Sampling and analysis shall be performed using the sampling and analysis procedure approved by the Engineer and the disposal facility.

The Contractor may perform additional tests on the material to be excavated for confirmation of the classification as hazardous material or Class II material. Sampling and analysis shall be based on guidelines in USEPA, SW 846, "Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods." Changes in classification of materials will be handled in accordance with Section 4-1.03, "Changes," of the Standard Specifications.

The Contractor shall submit, for approval by the Engineer, a Sampling and Analysis Plan that describes the scope of the investigation, along with the name, address, and certification number of the testing laboratory, 15 working days prior to beginning any sampling or analysis for additional disposal facility requirements, reclassification of material, characterization of material outside of the excavation pay limits or the horizontal limits of the classification zones shown on the plans. The Sampling and Analysis Plan shall be prepared under the guidance of a registered professional experienced in site characterization. The Engineer will make the final decision on reclassification or characterization of material after review of the test data. Six working days shall be allowed for review of test data.

Sampling and analysis of material excavated from outside the horizontal limits of the material classification zones shown on the plans will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications

Operations shall be conducted in a manner that prevents increases in the quantities of hazardous material resulting from mixing with material containing lower contaminant concentrations. No additional compensation will be made for material requiring reclassification due to failure to segregate the material after excavation.

Hazardous material and Class II material will be measured in conformance with the Standard Specifications and these special provisions for the type of excavation involved.

The contract price paid per cubic meter for roadway excavation (hazardous) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in excavating, stockpiling, loading, sampling and analyzing, hauling, and disposing of hazardous material, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per cubic meter for roadway excavation (Class II) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in excavating, stockpiling, loading, sampling and analyzing, hauling, and disposing of hazardous material, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for excavating, loading, stockpiling, transporting, and disposing of hazardous material to construct the concrete entrance canopy shall be considered as included in the contract price paid per cubic meter for roadway excavation (hazardous) and no additional compensation will be allowed therefor.

SOLDIER PILE WALL EARTHWORK

General

The Contractor shall submit to the Engineer working drawings and a construction sequence for the proposed method of soldier pile wall construction for the site. The drawings shall conform to the provisions in "Working Drawing," of these special provisions. The drawings shall be signed by an engineer who is registered as a Civil Engineer in the State of California. One set of the drawings and construction sequence, and one copy of the design calculations, shall be furnished to the Engineer. The working drawings and construction sequence shall include, but not be limited to, defining order of work, traffic control, method of installation of soldier piles, method of placing lagging, limits of structure excavation lifts, and type of drilling and excavation equipment to be used. The Contractor shall allow one week after complete drawings and all support data are submitted for the review and approval of the proposed method of soldier pile wall construction.

Should the Engineer fail to complete the review and approval within the time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in working drawings and construction sequence plan review and approval for the soldier pile wall, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Structure Excavation (Soldier Pile Wall)

Excavation and construction of the soldier wall shall proceed from the top down in lifts.

Care shall be taken in performing structure excavation (soldier pile wall) for placement of lagging such that a minimal void behind the lagging is required to be backfilled.

At the end of the work shift, lagging shall be in place the full height of the exposed excavation face.

Structure Backfill (Soldier Pile Wall)

Material for structure backfill behind lagging shall conform to the provisions in Section 19-3, "Structure Excavation and Backfill," of the Standard Specifications. Structure backfill behind lagging shall be compacted by hand tamping, mechanical compaction or other means approved by the Engineer.

Structure backfill in fill areas behind the lagging shall be keyed into the existing or excavated back slope.

Lean Concrete Backfill

At the option of the Contractor, lean concrete backfill may be used for backfill behind the lagging. The lean concrete backfill shall conform to the provisions for slurry cement backfill in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications, except that aggregate shall be sand suitable for making commercial quality concrete.

Lean concrete backfill in the portions of the drilled holes occupied by lagging and in front of the soldier pile flanges shall be removed as necessary to install lagging.

Concrete Backfill

Concrete backfill encasing the steel soldier piles below the lagging shall be Class 3 concrete conforming to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Concrete backfill encasing steel soldier piles below the lagging will be measured and paid for by the cubic meter as concrete backfill in the same manner specified for structure backfill in Section 19-3.07, "Measurement," and Section 19-3.08, "Payment," of the Standard Specifications.

Full compensation for working drawings and construction sequence, and temporary supports and shoring, if required, for soldier pile wall construction shall be considered as included in the contract price paid per cubic meter for structure excavation (soldier pile wall) and no additional compensation will be allowed therefor.

10-1.30 EROSION CONTROL (NETTING)

Erosion control (netting) shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Erosion control (netting) work shall consist of installing erosion control netting as shown on the plans. .

Following the installation of erosion control netting, erosion control materials shall be applied onto the netting face as specified in Erosion Control (Type D) of these specifications.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions:

A. Erosion Control Netting

Erosion control netting shall consist of 100 percent spun coir fiber and shall conform to the following:

Specification	Requirement
Weight, grams per square meter ASTM Designation: D 3776	400
Minimum Tensile Strength, kilonewtons, ASTM Designation: D 4595-86	9.0 to 11.3 kN/m in longitudinal direction (dry) 5.0 to 10.7 kN/m in cross-direction (dry) 6.0 to 9.8 kN/m in longitudinal direction (wet) 4.0 to 9.4 kN/m in cross- direction (wet)
Roll Width, meters, min.	4
Area/Roll, square meters, min.	200
Open Area, percent	63-70

B. Staples

Staples for erosion control netting shall be made of 3.05-mm minimum steel wire and shall be U-shaped with 200-mm legs and 50-mm crown.

INSTALLATION

Erosion control (netting) materials shall be installed as shown on the plans and as follows:

Erosion control netting installed on slopes, shall be placed in strips and anchored. Longitudinal and transverse joints of netting shall be overlapped and stapled as shown on the plans. Staples shall be driven perpendicular to the netting such that the top of the staple is flush with the ground surface. Stapling pattern shall be located and spaced as shown on the plans.

MEASUREMENT AND PAYMENT

The quantity of erosion control (netting) will be determined by the square meter from actual measurement of the area covered by the erosion control netting.

The contract price paid per square meter for erosion control (netting) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing and anchoring erosion control netting, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.31 MOVE-IN/MOVE-OUT (EROSION CONTROL)

Move-in/move-out (erosion control) shall include moving onto the project when an area is ready to receive temporary soil stabilization or erosion control as determined by the Engineer, setting up all required personnel and equipment for the application of temporary soil stabilizer or erosion control materials and moving out all personnel and equipment when work in that area is completed.

When areas are ready to receive applications of temporary soil stabilization or erosion control (Type D), as determined by the Engineer, the Contractor shall begin soil stabilization or erosion control work in that area within 5 working days of the Engineer's notification to perform the soil stabilization or erosion control work.

Attention is directed to the requirements of temporary soil stabilizer and erosion control (Type D) elsewhere in these special provisions.

Quantities of move-in/move-out (erosion control) will be determined as units from actual count as determined by the Engineer. For measurement purposes, a move-in followed by a move-out will be considered as one unit.

The contract unit price paid for move-in/move-out (erosion control) shall include full compensation for furnishing all labor, materials (excluding erosion control materials), tools, equipment, and incidentals and for doing all the work involved in moving in and removing from the project all personnel and equipment necessary for application of temporary soil

stabilizer and erosion control (Type D), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.32 EROSION CONTROL (TYPE D)

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to erosion control (netting) areas, embankment and excavation slopes and other areas disturbed by construction activities.

Erosion control (Type D) shall be applied during the period starting September 1 and ending November 30; or, if the slope on which the erosion control is to be placed is finished during the winter season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately; or, if the slope on which the erosion control is to be placed is finished outside both specified periods and the contract work will be completed before September 1, the erosion control shall be applied as a last item of work.

Erosion control (Type D) shall be applied when an area is ready to receive erosion control as determined by the Engineer and in conformance with the provisions in "Move-in/Move-out (Erosion Control)" of these special provisions.

If the slope on which the erosion control is to be placed is finished during the rainy season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately to the slope.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

Erosion Control (Type D) shall be applied upon completion of erosion control (netting).

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Legume Seed

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

- A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.
- B. Inoculated seed shall have a calcium carbonate coating.
- C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.
- D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.
- E. Legume seed shall consist of the following:

LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Lotus purshianus (Spanish clover)	40	5.0
Lupinus bicolor (Pygmy-Leaf Lupine)	50	4.0
Trifolium incarnatum (Crimson clover)	50	10.0
Lupinus succulentus (Arroyo Lupine)	50	7.0

Non-Legume Seed

Non-legume seed shall consist of the following:

NON-LEGUME SEED		
Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Hordeum vulgare 'UC 337' (Cereal Barley)	80	45.0
Eschscholzia californica (California Poppy)	50	6.0
Collinsia heterophyllus (Chinese houses)	40	2.0
Hordeum californicum (California Barley)	50	14.0
Elymus glaucus, Berkeley (Blue wild Rye, berkeley)	40	12.0
Nassella Pulchra (Purple needlegrass)	35	10.0
Achillea millefolium (White Yarrow)	35	1.0

Compost

Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost. The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume. A minimum internal temperature of 57°C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 9.5-mm screen. The moisture content of the compost shall not exceed 35 –40 percent. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 –40 percent. Moist samples of compost on an as received basis shall be dried in an oven at a temperature between 105°C and 115°C until a constant dry weight of the sample is achieved. The percentage of moisture will be determined by dividing the dry weight of the sample by the moist weight of the sample and then multiplying by 100. Compost will be tested for maturity and stability with a Solvita test kit. The compost shall measure a minimum of 5-6 on the maturity and stability scale.

Stabilizing Emulsion

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive derivative of *Plantago ovata* used as a soil tackifier.

APPLICATION

Erosion control materials shall be applied in separate applications in the following sequence:

- A. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

Material	Kilograms Per Hectare (Slope Measurement)
Legume Seed	26.0
Non-Legume Seed	90.0
Fiber	310
Compost	940

B. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope Measurement)
Fiber	310
Compost	940
Stabilizing Emulsion (Solids)	140

Hydraulic application of materials for erosion control (netting) areas shall be by hose, from the ground. Erosion control materials shall be applied at close range onto the slope face such that the materials are well integrated into the erosion control materials and in close contact with the ground surface. Application shall be perpendicular to the slope face such that erosion control (netting) materials are not damaged or displaced. Any erosion control materials that are damaged or displaced shall be immediately be repaired by the Contractor at his expense.

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

MEASUREMENT AND PAYMENT

Compost (erosion control) will be measured by the kilogram or tonne, whichever unit is designated in the Engineer's Estimate. The weight will be as determined by the Engineer from marked mass and sack count or from scale weighings.

The contract price paid per kilogram or tonne for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.33 AGGREGATE BASE

Aggregate base shall be Class 3 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

The restriction that the amount of reclaimed material included in Class 3 aggregate base not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 3 aggregate base may include reclaimed glass. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

Aggregate for Class 3 aggregate base shall conform to the following requirements:

Sieve Sizes	Grading Requirements (Percentage Passing)	
	19-mm Maximum	
	Operating Range	Contract Compliance
50-mm		
37.5-mm		
25-mm	100	100
19-mm	90-100	57-100
4.75-mm	35-60	30-65
600-µm	10-30	5-35
75-µm	2-11	0-14

Grading Requirements (Percentage Passing)

Sieve Sizes	37.5-mm Maximum	
	Operating Range	Contract Compliance
50-mm	100	100
37.5-mm	90-100	87-100
25-mm	-	-
19-mm	50-80	45-90
4.75-mm	25-45	20-50
600-µm	10-25	6-29
75-µm	2-11	0-14

Quality Requirements

Tests	Operating Range	Contract Compliance
Sand Equivalent	25 Min.	22 Min.
Resistance (R-value)	-	78 Min.
Durability Index	-	35 Min.

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed. Untreated reclaimed asphalt concrete and portland cement concrete will not be considered to be treated with lime, cement or other chemical material for purposes of performing the Durability Index test.

10-1.34 ASPHALT CONCRETE

Asphalt concrete shall be Type A and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

The amount of asphalt binder used in asphalt concrete placed in dikes and overside drains shall be increased one percent by mass of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

The asphalt content of the asphalt mixture will be determined in conformance with the requirements in California Test 379, or in conformance with the requirements in California Test 382.

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer.

Paint binder (tack coat) shall be, at the option of the Contractor, either slow-setting type asphaltic emulsion, rapid setting asphaltic emulsion or paving asphalt. Slow-setting type asphaltic emulsion and rapid setting asphaltic emulsion shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications. When paving asphalt is used for paint binder, the grade will be determined by the Engineer. Paving asphalt shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 92, "Asphalts," of the Standard Specifications.

Paint binder (tack coat) shall be applied in the liter per square meter range limits specified for the surfaces to receive asphalt concrete in the tables below. The exact application rate within the range will be determined by the Engineer.

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) for Asphalt Concrete (except Open Graded) and on Portland Cement Concrete Pavement		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion L/m ² (Note A)	Rapid-Setting Asphaltic Emulsion L/m ² (Note B)
Dense, compact surfaces, between layers, and on PCCP	0.20 – 0.35	0.10 – 0.20
Open textured, or dry, aged surfaces	0.35 – 0.90	0.20 – 0.40

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.

Note B: Undiluted rapid-setting asphaltic emulsion.

Application Rates for Paint Binder (Tack Coat) for Asphalt Concrete (except Open Graded)	
Type of surface to receive paint binder (tack coat)	Paving Asphalt L/m ²
Dense, compact surfaces and between layers	0.05 – 0.10
Open textured, or dry, aged surfaces	0.10 – 0.25

When asphaltic emulsion is used as paint binder (tack coat), asphalt concrete shall not be placed until the applied asphaltic emulsion has completely changed color from brown to black.

The miscellaneous areas to be paid for at the contract price per square meter for place asphalt concrete (miscellaneous area), in addition to the prices paid for the materials involved, shall be limited to the areas listed on the plans.

In addition to the provisions in Section 39-5.01, "Spreading Equipment," of the Standard Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete to the lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 9 m. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 9 m long. The end of the screed farthest from centerline shall be controlled by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 3-mm tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same way it was controlled when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of Section 39-6.03, "Compacting," of the Standard Specifications, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during a day's work, the Contractor may manually control the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the provisions in this section before starting another day's work.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

A drop-off of more than 45 mm will not be allowed at any time between adjacent lanes open to public traffic.

Half-width surfacing operations shall be performed in a manner that, at the end of each day's work, the distance between the ends of adjacent surfaced lanes shall not be greater than can be completed in the following day of normal surfacing operations.

Where the existing pavement is to be widened by constructing a new structural section adjacent to the existing pavement, the new structural section shall be completed to match the elevation of the edge of the existing pavement at each location prior to spreading and compacting asphalt concrete over the adjacent existing pavement.

Asphalt concrete surfacing shall be placed on existing surfacing, including curve widening, chain control lanes, turnouts, left turn lanes, and public and private road connections shown on the plans, unless otherwise directed by the Engineer.

10-1.35 SOLDIER PILE RETAINING WALL

This work shall consist of furnishing and constructing soldier pile retaining wall at location as shown on the plans. The soldier pile retaining wall shall conform to the provisions in "Earthwork," "Drilled Holes," "Piling," "Portland Cement Concrete," and "Timber Lagging" of these special provisions.

10-1.36 PILING

GENERAL

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Unless otherwise specified, welding of any work performed in conformance with the provisions in Section 49, "Piling," of the Standard Specifications, shall be in conformance with the requirements in AWS D1.1.

Attention is directed to "Project Information," of these special provisions, regarding soil samples and rock cores available as available for inspection.

Attention is directed to "Welding" of these special provisions.

Difficult pile installation is anticipated due to underground utilities and the requirements of sound control.

STEEL SOLDIER PILING

This work shall consist of furnishing and installing steel piling; cleaning and preparing portions of the pile for splicing; splicing steel piles; securing the piling prior to and during concrete encasement; shaping the tops of the piles; cleaning and preparing portions of the pile for welding concrete anchors.

Materials

Steel soldier piles shall be W360x32.9, W360x51, and W360x72 as shown on the plans and shall conform to Section 49-5, "Steel Piles," of the Standard Specifications and these special provisions.

Construction

Steel soldier piles shall be placed in a drilled hole and shall be plumbed and aligned before placing concrete backfill. Alignment shall be maintained while placing backfill material in the drilled holes.

Cleaning and preparing the pile shall be performed in heat affected areas before splicing steel piles.

MEASUREMENT AND PAYMENT (PILING)

Measurement and payment for the steel soldier piling for the various sizes of piles shall conform to the provisions in Sections 49-6.01, "Measurement," and 49-6.02, "Payment," of the Standard Specifications and these special provisions.

The contract prices paid per meter for furnish steel soldier piling for the various sizes of piles shown in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the steel soldier piles at the site to the required penetration, including securing the piling to maintain accurate alignment prior to and during encasing the pile with concrete, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.37 DRILLED HOLES

Holes for steel soldier piles shall be drilled into natural foundation materials at the location shown on the plans and shall conform to the provisions in Section 49, "Piling," of the Standard Specifications and these special provisions.

Foundation recommendations are included in the "Information Handout" available to the Contractor in conformance with the provisions in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Drilled holes shall be accurately located and shall be straight and true. When the piles are plumbed and aligned, the steel piles shall be at least 25 mm clear of the sides of the hole for the full length of the hole to be filled with concrete backfill and lean concrete backfill. Holes which do not provide the clearance around steel piles shall be reamed or enlarged at the Contractor's expense.

Difficult drilling is anticipated due to the presence of underground utilities and the requirements of sound control.

Attention is directed to rock subsurface foundation material at the soldier pile retaining wall site. Conventional drilling equipment for drilling in soils may not be suitable for drilling piling for the soldier pile retaining wall.

Loose materials existing at the bottom of the hole after drilling operations have been completed shall be removed before placing the pile.

Materials resulting from drilling holes shall be disposed of in conformance with the provisions in Section 19-2.06, "Surplus Material," of the Standard Specifications.

Drilling mud or chemical stabilizers shall not be used. Surface water shall not be permitted to enter the hole and all water in the hole shall be removed before placing concrete therein.

Casing, if used in drilling operations, shall be removed from the hole as concrete is placed therein. The bottom of the casing shall be maintained not more than 1500 mm nor less than 300 mm below the top of the concrete during casing withdrawal and concrete placing operations. Separation of the concrete during withdrawal operations shall be avoided by hammering or otherwise vibrating the casing. The methods used to withdraw temporary casings shall preclude contamination of the concrete and commingling of the soil and concrete or of any ground water and concrete.

If piles with larger diagonal dimensions are substituted for the piles shown on the plans, the Contractor shall, at his expense, ream or enlarge the drilled hole to provide a hole diameter at least 100 mm larger than the diagonal dimension of the pile.

The contract price paid per meter for drilled hole (soldier piles) of the diameter shown on the plans shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in drilling holes for soldier piles, including disposing of the material resulting from drilled holes, dewatering, casing holes and removing casing, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.38 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications.

10-1.39 TIMBER LAGGING

Timber lagging shall conform to the details shown on the plans and the provisions in Sections 57, "Timber Structures," and 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications and these special provisions.

All timber members shall be preservative treated Douglas fir of the grades shown on the plans. Timber members shall be full sawn to the dimensions shown on the plans.

Preservative treatment shall be with creosote, creosote-coal tar solution, creosote-petroleum solution (50-50), or pentachlorophenol (Type A) preservative.

Timbers 100 mm thick or less shall be installed with a 10 mm gap between lagging members except where shown on the plans. Timbers greater than 100 mm thick shall be installed with a 13 mm gap between lagging members except where shown on the plans.

10-1.40 ROADSIDE SIGNS

Roadside signs shall be installed at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in Section 56-2, "Roadside Signs," of the Standard Specifications and these special provisions.

Wood posts shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 kg/m³, and need not be incised.

10-1.41 FIBER-OPTIC CONDUIT

Fiber-optic conduits to be installed underground for the fiber-optic lines shall be 100-mm diameter plastic pipes, PolyVinyl Chloride (PVC), Schedule 40, and shall be encased in concrete, as shown on the plans and as specified in these special provisions.

Concrete for the concrete encasement shall be Class 4 Concrete and shall conform to the provisions in "Portland Cement Concrete," of the these special provisions.

Concrete encasement shall be as shown on the plans.

The fiber optic conduit is shown on utility plans.

Fiber optic conduit (2-100 mm concrete encased) will be measured and paid for by the meter in the same manner specified for plastic pipe in Sections 64-1.08, "Measurement," and 64-1.09, "Payment," of the Standard Specifications.

Full compensation for concrete encasement shall be considered as included in the contract price paid per meter for fiber optic conduit (2-100 mm concrete encased) and no separate payment will be made therefor.

10-1.42 REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications and these special provisions.

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using Method 1 backfill in trench, as shown on Standard Plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be required unless the minimum distance between the top of the pipe and the pavement surface is the greater of 1.2 m or one half of the outside diameter of the pipe.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

When solid rock or other unyielding material is encountered at the planned elevation of the bottom of the bedding, the material below the bottom of the bedding shall be removed to a depth of 1/50 of the height of the embankment over the top of the culvert, but not less than 150 mm nor more than 300 mm. The resulting trench below the bottom of the bedding shall be backfilled with structure backfill material in conformance with the provisions in Section 19-3.06, "Structure Backfill," of the Standard Specifications.

The excavation and backfill below the planned elevation of the bottom of the bedding will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

10-1.43 OVERTHROW DRAIN

Asphalt concrete overthrow drains shall conform to the provisions in Section 69, "Overthrow Drains," of the Standard Specifications.

10-1.44 MISCELLANEOUS FACILITIES

Concrete flared end sections shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

10-1.45 ROCK SLOPE PROTECTION

Rock slope protection shall be placed or constructed in conformance with the provisions in Section 72, "Slope Protection," of the Standard Specifications and these special provisions.

Rock slope protection fabric shall be woven or nonwoven type fabric, Type A.

10-1.46 MISCELLANEOUS CONCRETE CONSTRUCTION

Curbs, gutters, and inlet aprons shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications.

10-1.47 MISCELLANEOUS IRON AND STEEL

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications.

10-1.48 CHAIN LINK FENCE AND GATE (TYPE CL-2.4, BLACK VINYL-CLAD)

Chain link fence shall be Type CL-2.4 and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

Barbed wire supporting arms and vinyl coated chain link fabric shall conform to the requirements in "Sliding Gate" of these special provisions.

10-1.49 DELINEATORS

Delineators shall conform to the provisions in Section 82, "Markers and Delineators," of the Standard Specifications and these special provisions.

Delineators on flexible posts shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Flexible posts shall be made from a flexible white plastic which shall be resistant to impact, ultraviolet light, ozone, and hydrocarbons. Flexible posts shall resist stiffening with age and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability.

Retroreflective sheeting for metal and flexible target plates shall be the retroreflective sheeting designated for channelizers, markers, and delineators conforming to the requirements in ASTM Designation: D 4956-95 and in conformance with the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

10-1.50 METAL BEAM GUARD RAILING

Metal beam guard railing shall be constructed in conformance with the provisions in Section 83-1, "Railings," of the Standard Specifications and these special provisions.

Line posts and blocks shall be wood.

Metal beam guard railing elements and required backup plates, terminal sections, end sections, and return sections shall conform to the requirements of Type 2 W-Beam as shown in AASHTO Designation: M 180.

TERMINAL SYSTEM (TYPE SRT)

Terminal system (Type SRT) shall be furnished and installed as shown on the plans and in conformance with these special provisions.

Terminal system (Type SRT) shall be a SRT-350 Slotted Rail Terminal (8 post system) as manufactured by Trinity Industries, Inc., and shall include all the items detailed for terminal system (Type SRT) shown on the plans.

The 5 mm x 44 mm x 75 mm plate washer shown on the elevation view and in Section D-D at Wood Post No. 1 shall be omitted.

Arrangements have been made to insure that any successful bidder can obtain the SRT-350 Slotted Rail Terminal (8 post system) from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, Telephone 1-800-772-7976. The price quoted by the manufacturer for the SRT-350 Slotted Rail Terminal (8 post system), FOB Centerville, Utah is \$845, not including sales tax.

The above price will be firm for orders placed on or before December 31, 2003, provided delivery is accepted within 90 days after the order is placed.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that terminal systems (Type SRT) conform to the contract plans and specifications, conform to the prequalified design and material requirements and were manufactured in conformance with the approved quality control program.

The terminal system (Type SRT) shall be installed in conformance with the manufacturer's installation instructions and these requirements. The steel foundation tubes with soil plates attached, shall be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 100 mm thick and each layer shall be moistened and thoroughly compacted. Wood terminal posts shall be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 65°C or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system (Type SRT) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

10-1.51 INSTALL FIRE HYDRANT

The work shall consist of installing State-furnished fire hydrants. All other materials and accessories such as tee connection with the main, service pipe, riser, bury, gate valve with cover, restraining rings, and bell bends, as shown on the plans, and as specified in "Water Mains," of these special provisions shall be supplied and installed by the Contractor.

Hydrant shall be secured by installing lugs, restraining ring assembly, bell band and tie rod bolts as shown on the plans and/or directed by the Engineer. Concrete thrust block, of such size as the Engineer may direct, shall be 21 MPa strength and poured against undisturbed ground in the bottom and side of the trench. The backfill around the block shall be thoroughly tamped.

Hydrant shall be set exactly plumb and at the proper elevation on a block of reinforced concrete or as directed by the Engineer. Contractor shall backfill where underground installation is complete. Backfilling shall be in accordance with the applicable requirements of the Standard Specifications. In completing the backfill, hydrant shall be kept plumb and adequate support to prevent future movement shall be provided. Any hydrant which is out of plumb or not firmly supported shall be properly reset by the Contractor at his sole expense.

The contract unit price paid for install fire hydrant shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fire hydrants, complete in place, including pick up and delivery of the State-furnished fire hydrants, cleaning and testing fire hydrant, and excavation and backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.52 WATER MAINS

PART 1-GENERAL

SUMMARY

Scope.-This work shall consist of furnishing and installing water mains, complete with pipes, fittings, valves, accessories and incidentals necessary to complete the work for a ready to operate domestic water distribution system.

The work includes excavating, trenching, backfilling, and testing with the exception of disinfection, in accordance with the details shown on the plans, as specified in the Standard Specifications, and these special provisions.

For the City and County of San Francisco, the San Francisco Public Utilities Commission/Water Department (SFWD) is the jurisdictional water utility district.

Attention is directed to "Obstructions," of these special provisions, regarding schedule and coordination for the installation of SFWD water mains.

Attention is directed to "Install Fire Hydrant," of these special provisions, regarding installation of State-furnished fire hydrant.

SFWD Work

SFWD will make all connections and disconnections to and from the existing water mains, connections of existing service pipes to new mains (retap), connections of Contractor installed new service pipes to existing meters and all other work that involves cutting or otherwise disturbing the existing water system.

SFWD will also provide disinfection of the new lines by chlorination as specified in these special provisions.

For all work to be done by SFWD, the Contractor shall perform all excavation and backfill.

REFERENCE STANDARDS

The regulatory requirements which govern the work of this Section include the following governing Codes and Standards, and the State water work standards:

A. American Society for Testing and Materials (ASTM):

1. ASTM Designation A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. ASTM Designation B88 Seamless Copper Water Tube
3. ASTM Designation D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 4.54-kg Rammer and 457-mm Drop

B. American Water Works Association (AWWA):

1. AWWA C104 Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water
2. AWWA C105 Polyethylene Encasement for Ductile-Iron Pipe Systems
3. AWWA C110 Ductile-Iron and Gray-Iron Fittings, 75 mm through 1200 mm, for Water and Other Liquids
4. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids
5. AWWA C153 Errata Nov 1996) Ductile-Iron Compact Fittings, 76 mm through 610 mm and 1,400 mm through 1,600 mm for Water Service
6. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
7. AWWA C203 Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot-Applied
8. AWWA C504 Rubber-Seated Butterfly Valves
9. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service
10. AWWA C600 Installation of Ductile-Iron Water Mains and Their Appurtenances
11. AWWA C800 Underground Service Line Valves and Fittings

C. American Society of Mechanical Engineers (ASME):

1. ASME B16.26 Cast Copper Alloy Fittings for Flared Copper Tubes
2. ASME B16.3 Malleable Iron Threaded Fittings

D. Manufacturers Standardization Society of the Valve and Fittings Industry (Mss):

1. MSS SP-80 Bronze Gate, Globe, Angle and Check Valves

SUBMITTALS

General Submittals:

General.-Submit listed submittals in accordance with the provisions of the Contract Documents.

Product Data.-Submit respective manufacturer's product data including catalog cuts, descriptive drawings, and literature, with all exceptions to the Specifications noted for each equipment item to be furnished under this Section including, but not limited to, ductile iron pipe, copper tubing, fittings, gaskets, valves, polyethylene encasement material and appurtenances.

Shoring Plans.-Submit Shoring Plans and calculations for excavation depths greater than 1.5 meters. Shoring plans shall be signed and stamped by an engineer who is registered as a Civil or Structural Engineer in the State of California if plans deviate from Caltrans Standards.

Construction Schedule:

Attention is directed to "Obstructions" of these special provisions, regarding duration and work to be performed by SFWD personnel, regarding to the water mains relocation.

The Contractor shall submit Construction Schedule that will include time for the SFWD personnel to complete their work as specified herein. The Contractor shall incorporate the SFWD required times in his/her schedule. The Contractor shall confer with the Engineer in the preparation of the schedule that needs to satisfy the water distribution operation and minimize disruption of the services. No construction for water work shall be started until the Engineer approves the schedule.

The Contractor shall complete the excavation of the trench and install appropriate shoring to the satisfaction of the Engineer before SFWD personnel can do any work.

Quality Assurance Submittals:

Test Reports.-Certified test reports showing compliance with specified performance characteristics and physical properties.

Manufacturer's Instructions.-Manufacturer's installation instructions.

Closeout Submittals:

Record Drawings.-Record actual location of distribution mains, valves, connections, and invert elevations for review.

DELIVERY, STORAGE & HANDLING

Ordering.-Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

Storage and Protection.-Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

SITE CONDITIONS

Excavations in which products will be buried shall be dry.

Coordinate the installation of the water supply system with the SFPUC/SFWD.

PART 2. – PRODUCTS

MATERIALS

Pipes

Pipe sizes of 100 mm and larger.-Pipe shall be ductile iron, Class 53 with Tyton bell and spigot ends conforming to ANSI/AWWA C151/A21.51, latest editions.

Pipe sizes of less than 100 mm in diameter (Underground Installation).-Pipe shall be copper tubing, conforming to ASTM Designation B 88, Type K, annealed.

Pipe sizes of less than 100 mm in diameter (Aboveground Installation).-Pipe shall be galvanized steel pipe, standard weight, conforming to ASTM A53.

Fittings

Fittings for Ductile Iron Pipe.-Ductile Iron Push-On Tyton compact fittings shall conform to the applicable requirements of ANSI/AWWA C110/A21.10, or ANSI/AWWA C153/A21.53, latest revisions, unless otherwise specified herein. Fittings shall accommodate a "Field-Lok" type gasket.

Fittings for Copper Pipe.-Fittings shall be bronze/copper flared conforming to ASME B16.26. Fittings shall accommodate a "Field-Lok" type gasket.

Fittings for Galvanized Steel Pipe.-Fittings shall be screwed fittings conforming to ASME B16.3. Flanged fittings shall conform to AWWA C207. Fittings shall be galvanized.

Lining and Coating.-Ductile iron pipe, and fittings shall be lined with double cement-mortar lining with an asphaltic seal coating, 0.03 mm (1 mil), in accordance with AWWA C104. The exterior of ductile iron pipe, specials, and fittings shall be coated with a 0.03-mm (1-mil) asphaltic coating in accordance with AWWA C151, Section 51-9.

Protective Materials for Galvanized Steel Pipe.—Protective materials for steel pipe, except as otherwise specified, shall be mechanically applied in a factory or plant especially equipped for the purpose. The materials shall, unless otherwise indicated on the plans, consist of the following: The pipe shall be thoroughly cleaned of foreign material by wire brushing and solvent cleaning, and then given 1 coat of coal-tar primer and 2 coats of coal-tar enamel conforming to AWWA C203. Threaded ends of pipe and fittings shall be adequately protected prior to coating.

Pipe Joints

Joints for Ductile Iron Pipe.-Joints for ductile iron pipe 100 mm and larger, "Field-Lok" type of gaskets shall be used.

Joints for Copper Pipe.-Joints shall be compression-pattern flared, sweated, flared, flanged or screw-in as required per SFWD Standards -and shall be made with the specified fittings.

Joints for Galvanized Steel Pipe.-Joints shall be as follows:

- A. **Mechanical Couplings:** Mechanical couplings for steel pipe shall be the sleeve type, or when approved, the split-sleeve type and shall provide a tight flexible joint under all reasonable conditions, such as pipe movements caused by expansion, contraction, slight setting or shifting in the ground, minor variations in trench gradients, and traffic vibrations. Couplings shall be of strength not less than the adjoining pipeline.
- B. **Bonded Joints:** Bonded joints shall be used to maintain electrical continuity in metallic pipeline where cathodic protection is provided during construction or where it is anticipated that cathodic protection will be provided in the future. Where indicated, for all ferrous pipe, a metallic bond shall be provided at each joint, including joints made with flexible couplings, caulking, or rubber gaskets, of ferrous metallic piping to effect continuous conductivity. The bond wire shall be Size 1/0 copper conductor suitable for direct burial shaped to stand clear of the joint. The bond shall be of the thermal weld type.
- C. **Isolation Joints:** Isolation joints shall be installed between nonthreaded ferrous and nonferrous metallic pipe, fittings and valves. Isolation joints shall consist of a sandwich-type flange isolation gasket of the dielectric type, isolation washers, and isolation sleeves for flange bolts. Isolation gaskets shall be full faced with outside diameter equal to the flange outside diameter. Bolt isolation sleeves shall be full length. Units shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements.
 1. Sleeve-type couplings shall be used for joining plain end pipe sections. The two couplings shall consist of one steel middle ring, two steel followers, two gaskets, and the necessary steel bolts and nuts to compress the gaskets.
 2. Split-sleeve type couplings may be used in aboveground installations when approved in special situations and shall consist of gaskets and a housing in two or more sections with the necessary bolts and nuts.

Valves

Valves 100 mm and Larger.-Valves 100 mm and larger in size shall be push-on (Tyton by Tyton ends) and can accommodate "Field-Lok" gaskets, resilient seated, non-rising stem, right turn open and nut operated.

Valves Smaller than 80 mm.-Valves smaller than 80 mm shall be all bronze and shall conform to MSS SP-80, Type 1, Class 150. Connections shall be screw-in, flared, or flanged as required.

Polyethylene Encasement.-Polyethylene encasement for pipe and fittings shall conform to AWWA C105. Eight (8) mil Polyethylene tubes shall be used.

MISCELLANEOUS METAL

All connecting devices, including Tie Rods, Rod Couplings, Pipe Clamps, Restraints and related hardware shall be as shown on plans.

Saddle shall feature brass body with stainless steel straps and hardware.

TRENCH BEDDING AND BACKFILL

Sand Bed.-All pipe shall be constructed on a prepared or natural sand bed the width of which shall be at least 300 mm plus the full width of the pipe, and not less than 300 mm thick below the pipe after installation.

Sand Backfill.-Backfill around all pipes from the bottom of the trench to a height 150 mm above the top of pipes for the full width of the trench shall be sand only. Sand backfill material shall be in accordance with the applicable requirements of the Standard Specifications.

Backfill Above Required Sand.-Backfill material above the required sand shall be in accordance with the applicable Standard Specifications.

PART 3. - EXECUTION

MAINTAINING WATER SERVICES

Maintain water service and conduct operations at times selected to minimize the duration and inconvenience of service interruption.

Keep existing water mains that will be replaced by new water mains in service until new water mains are ready for service.

Water valves in service shall be operated only by SFWD personnel.

CUTTING OF PIPE

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Engineer, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable.

PIPE INSTALLATION

A. No pipe shall be installed before the street or roadway sub-base is built.

B. Before any trench is excavated, the Contractor shall make openings in the roadway or sidewalk as directed by the Engineer to verify a suitable alignment of the main.

The trench shall be excavated so that a 100 mm thick layer of sand bedding can be installed beneath the pipe bottom such that the barrel of the pipe will have an even bearing along its entire length and with sufficient clearance provided for any necessary operations in connection with the laying of the pipe. Bell holes shall be excavated for each pipe bell or joint.

C. Before any pipe may be installed, the grade of the trench bottom shall be to the satisfaction of the Engineer. Immediately prior to installing the pipe, the Contractor shall remove all loose rocks and other objectionable material from the bottom of the trench and bell holes. When the trench is properly prepared, the pipe shall be lowered therein, singly, without jar or strain, and assembled by piece inside the trench.

D. Joints for ductile iron pipe shall be fastened by use of "Field-Lok" gaskets, in accordance with AWWA C600, unless otherwise directed by the Engineer.

E. The pipe shall be joined in strict adherence to the pipe manufacturer's printed installation instructions.

F. When the ductile iron pipe is cut in the field, the outside of the cut end shall be beveled about 6 mm at an angle of about 30 degrees and the leading edge rounded. The prepared cut end shall be marked at 84 mm for a 300 mm water line and 83 mm for a 200 mm water line.

G. If the joint assembly is not accomplished with the application of reasonable force, the plain end of the pipe shall be removed to check the proper position of the gasket. At the end of each day, the Contractor shall plug the end of the laid pipe.

H. All connections to existing water mains will be made by SFWD. Contractor shall coordinate with SFWD to facilitate connection of the new and existing system.

I. Contractor shall provide locating/markings tape in the trench continuously over the centerline of the pipe per applicable requirements of these specifications.

J. The entire piping system (main and service) shall be encased with polyethylene tubes or sheets in accordance with AWWA C105. Tapes shall be used to seal the wrapping at joints and tees.

K. The Contractor shall paint all tie rods, lugs, restraining rings assembly and all miscellaneous metal attached to the pipeline installed by the Contractor and SFWD with two coats of Koppers Bitumastic No. 505 or two coats of Proteco Wrap CA160 or approved equal, applied in accordance with the manufacturer's directions.

L. Insulating flanges and/or couplings shall be installed to electrically isolate the newly installed portion of pipeline from existing metallic pipelines.

M. Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electric wiring. Water lines shall be 3.3 m horizontally and 0.3 m vertically from sewer lines. Water lines shall in all cases cross above sewage force mains or inverted siphons and shall be not less than 0.3 m above the sewer main. Submit proposals for the Engineer's approval if these requirements can not be met due to field conditions.

N. The maximum allowable joint deflection shall be as given by the pipe manufacturer. If the alignment requires deflection in excess of the above limitations, a sufficient number of shorter lengths of pipe shall be installed to provide angular deflections within the limit set forth.

O. Valves shall be securely anchored or shall be provided with restrained joints to prevent movement. All joints on lateral and dead end of 100 mm in diameter or larger pipes shall be restrained.

P. The Contractor shall complete the excavation of the pit and install appropriate shoring to the satisfaction of the Engineer before SFWD personnel can do any work.

Q. **Galvanized Steel Pipe Jointing Requirements.**-Screw joints shall be made tight with a stiff mixture of graphite and oil, inert filler and oil, or with an approved graphite compound, applied with a brush to the male threads only. Compounds shall not contain lead. Field joints shall be given 1 coat of coal-tar primer and 2 coats of coal-tar enamel conforming to AWWA C203. The tests of the coating shall conform to AWWA C203, and any flaws or holidays found in the coating of pipe and joints shall be repaired by patching or other approved means; the repaired areas shall be at least equal in thickness to the minimum coating required for the pipe.

R. **Copper Tubing Jointing Requirements.**-Joints shall be made with flared fittings. The flared end tube shall be pulled tightly against the tapered part of the fitting by a nut which is part of the fitting, so there is metal-to-metal contact.

IDENTIFICATION OF PUSH-ON GASKET JOINTS

The Contractor shall identify all joints with Push-On gaskets by spraying white marking paint on top of each bell and also by taping a direct burial tape around the spigot end of each pipe just in front of the bell.

INSTALLING PIPE FITTINGS

The Contractor shall include the procurement, placing, restraining, and protecting of all fittings, valves, joint restraints, and all other appurtenances to be incorporated in the work, as indicated in the Contract Documents or as directed by the Engineer.

Installation.-Bends, tees, and gates of 100 mm and larger in diameter shall be fastened to the pipe or to each other by use of "Field-Lok" type gaskets. Caps shall be fastened to the pipe by use of tie rods and lugs or restrainers as shown on plans or directed by the Engineer. Additional lug and tie rod joint restraints shall be installed at locations directed by the Engineer.

Valve Boxes.-Over each valve, a piece of ductile iron pipe of such size as may be required by SFWD shall be placed vertically to form a valve box. A suitable cover shall be placed on top of the pipe or box. The bottom of the box shall rest on a steel plate so placed as to prevent the box from bearing on the gate. Contractor shall cut the box to such lengths that the top of the gate cover will be flush with the surface of the finished pavements shown on plans. The word "WATER" shall be cast in the cover. The box length shall adapt, without full extension, to the depth of cover required over the pipe at the valve location.

INSTALLING SHORING

The Contractor shall install an approved shoring system for all excavations 1.5 meters or more in depth, in conformance with "Excavation Safety Plans," of these special provisions.

In locations where the SFWD crews will install service lines or connections to other lines, regardless of depth, the Contractor shall install a solid sheeting type shoring system, approved by the Engineer, that is capable of protecting all excavations from excessive water that may be present and give ample access to the crews to perform the installation. This shoring system is more stringent than Cal/OSHA standards. Shoring materials and equipment shall be removed from the excavation prior to completion of work.

INSTALLATION OF SCREW TAPS

The Contractor shall drill, tap, and install all screw taps and risers as indicated or as required by the Engineer.

Screw taps not satisfactorily installed in the opinion of the Engineer shall be removed and replaced at the expense of the Contractor. Where the screw tap installation is unsatisfactory, it shall be removed and replaced with a solid cast iron plug. The Contractor shall relocate screw taps at locations as directed by the Engineer.

FIELD QUALITY REQUIREMENTS

The Contractor shall obtain a relative compaction of not less than 95 percent throughout each layer of all backfill constructed within 1 meter of pavement subgrade, or adjacent ground. Below the top 1 meter of backfill, the relative compaction shall not be less than 90 percent. If tests indicate work does not meet specified requirements, remove such work, replace, and retest at no additional cost to the State.

The Contractor shall furnish all equipment, accessories and incidentals for the hydrostatic tests including temporary anchoring devices.

TESTS

- A. Protection from Flooding: Provide positive measures to protect exposed, installed pipe and compacted pipe bedding from flooding during testing.
- B. Notice of Hydrostatic Pressure Test:
 - 1. Give 72 hours notice of intention of hydrostatic pressure test to SFWD.
 - 2. Designate largest sections feasible for hydrostatic pressure test. Pressure test shall be performed by the Contractor; at Contractor's expense. The SFWD will perform chlorination.
- C. Testing Requirements:
 - 1. Perform hydrostatic tests in accordance with the requirements of the SFWD. All such tests shall be witnessed by the representative of the SFWD. The Contractor shall provide all labor and materials required for the tests and shall be responsible for making all such arrangements.
 - 2. Prior to backfilling, isolate the system by use of approved valves, caps and plugs, or other acceptable methods.
 - 3. Maintain such isolation throughout the performance of pressure testing.
 - 4. Where valves are used for isolation, eliminate leakage through such valves if it occurs. Maintain new work isolated from existing water mains, except for test connections, until testing and chlorination have been completed.
 - 5. Provide temporary anchorage as required for the test.
 - 6. Install the water source connection for testing the isolated section. The Engineer may permit the use of a tap which will be furnished and installed by SFWD.
 - 7. Where leakage occurs, perform necessary corrective measures.
 - 8. Remove and replace defective pipes, joints, fittings, valves, and other appurtenances. Reset such items if displaced.

The Contractor shall test the line to a hydrostatic pressure of 1.55 MPa. The actual pressure test of 1.55 MPa shall be maintained for not less than two (2) hours.

If any section of the pipe under test develops a leak evidenced by a test pressure drop, the Contractor shall repair or replace the defective portion of the pipe as directed by the Engineer at no additional cost. After all repairs are made, the pipe shall be retested.

DISINFECTION

Upon completion of satisfactory hydrostatic test, SFWD will disinfect the main. For disinfection scheduling purposes, refer to "Obstructions" of these special provisions. The SFWD will supply and install all piping, fittings, and other materials necessary to chlorinate the main, except screw taps and risers, which shall be installed by the Contractor. The Contractor shall not backfill the site of such work until the satisfactory disinfection of the main is verified by the Engineer.

CLEANUP

Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

MEASUREMENT AND PAYMENT

Water main will be measured along the centerline of the line, including fittings and valves, and paid for per meter for various sizes in the same manner specified for welded steel pipe in Section 70-1.04, "Measurement," and Section 70-1.05, "Payment," of the Standard Specifications.

Valves will be measured and paid for by their unit prices quoted therefore for various sizes and types of valves installed.

The contract price paid per meter for the various sizes and types of water mains involved shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing the different sizes and types of pipe, and fittings, complete in place, including structure excavation structure backfill, installing polyethylene encasement, shoring for all excavation by the Contractor or SFWD for connecting and disconnecting of water mains, and testing in as shown on the plans, and as specified in these special provisions, and as directed by the Engineer. Any related work shall be considered as incidental and no separate payment shall be made therefore.

The contract unit price paid for various types and sizes of gate valves shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals including valve boxes, and for doing all the work involved in furnishing and installing various types and sizes of valves, complete in place, including excavation, backfill, connecting and disconnecting of water mains, and testing, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.53 VITRIFIED CLAY PIPE SEWERS

PART 1.- GENERAL

SUMMARY

Scope.-This work shall consist of furnishing and installing vitrified clay pipe sewers including excavating, lagging, backfilling, and other incidental work, necessary or required for a complete, satisfactory sewer installation, in accordance with the details shown on the plans and these special provisions.

REFERENCES

The regulatory requirements which govern the work of this Section include the following codes and standards:

- A. ASTM Designation: C700.- Standard Specifications for Extra Strength Clay Pipe
- B. ASTM Designation: C425 - Tentative Specification for Compression Couplings for Vitrified Clay Plain-End Pipe
- C. ASTM Designation: D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort(2,700 kN-m/m³) Standard Specifications for Extra Strength Clay Pipe

SUBMITTALS

Test Reports: The Contractor shall furnish to the Engineer for approval prior to shipment of the VCP pipes copies of the certified test results indicating that the pipe furnished meets the requirements of ASTM Designation: C700. Also the Contractor shall furnish to the Engineer for approval copies of the certificate of compliance with ASTM Designation: C700 and design details of the rubber compression couplings.

HANDLING AND STORAGE

Pipes shall be handled and stored so as to prevent damage thereto, or to existing improvements. Pipes, when stored, shall be properly locked to prevent rolling.

PART 2.- PRODUCTS

PIPE

Vitrified Clay Pipes (VCP) shall conform to the ASTM Designation: C700 "Standard Specifications for Extra Strength Clay Pipe," except as modified by the plans and these special provisions.

The minimum thickness of the pipe barrel shall conform to the Regional Western Standard of the Clay Pipe Institute.

JOINTS

Joints for VCP plain-end pipe sewers 300 mm or smaller in diameter may be rubber compression couplings with stainless steel bands TYPE 316. Rubber compression couplings with Class 316 stainless steel bands shall be in accordance with the requirements of ASTM designation C425. Composition couplings with Class 316 stainless steel bands shall be in

accordance with the requirements of ASTM Designation: C425 "Tentative Specification for Compression Couplings for Vitrified Clay Plain-End Pipe".

PART 3.- EXECUTION

TRENCH EXCAVATION

Trench excavations shall conform with "Excavation Safety Plans," of these special provisions.

In excavations where sand or other non-cohesive material is encountered, placing of the necessary protective systems shall commence before a depth of 1.5 meter is attained. The protective systems shall conform to "Excavation Safety Plans," of these special provisions.

Tunneling or jacking shall not be used unless specified or approved in writing by the Engineer.

During construction, the Contractor shall construct and maintain satisfactory, substantial, and appropriate barricades and steel plates at all excavations, at locations where materials are stored, and at other hazards. All such enclosures shall have warning lights adequate for public safety.

High rise warning flag units, to provide advance warning for traffic approaching excavations, will be required in all cases where motorists' visibility of the work is limited or obscured. Where required, the Contractor shall provide and maintain safe and adequate passage for vehicular and pedestrian traffic over and adjacent to trenches and other excavations by the use of barricades, bridges and other approved means.

The Contractor shall take adequate measures, commensurate with the danger involved, to prevent unauthorized entry by children or others upon the area of excavation operations. The measures shall include the provision of proper and adequate guard railing, solid or chain link fence, and the placement of a difficult to remove weighted cover on each deep shaft excavation.

The use of vibratory hammers and other vibratory equipment will be subject to the approval of the Engineer. However, such approval does not relieve the Contractor of the responsibility for any damages or injuries resulting from the use thereof.

The use of high frequency vibrating equipment, or sonic equipment, for the driving or withdrawal of sheet piling, is prohibited.

EXCAVATIONS TO BE KEPT DRY

The Contractor shall protect the work from water damage, keep excavations dry and, by proper diversion and pumping, remove there from and dispose of all water and sewage that enter upon the work. He shall provide, maintain and operate all pumping equipment required for such purpose during the time concrete or other work is being placed and thereafter as required for the protection of the work. The aforesaid requirements shall be observed as necessary or required prior to the completion of drainage facilities specified or ordered to be constructed under the contract.

Dewatering and the rate and manner of lowering the water table shall be such as to minimize any settlement that might be caused thereby.

Pumping operations for excavations shall be continuous and satisfactory from the time drawdown is first accomplished until all the concrete has been placed. The Contractor shall not allow his pumping operations to be interrupted; shall take adequate precautions to such end; and shall assume full responsibility for any damage that occurs due to fluctuating water table in the area influenced by the dewatering.

Pumping from the interior of the excavation shall be done in such a manner that there will be no movement of water through any fresh concrete, and for a period of 24 hours after a pour shall be done from a suitable sump separated from the concrete work by a watertight wall or by other effective means.

The Contractor shall at all times, by the institution of proper precautions, prevent hydrostatic uplift and flotation of the work.

MINIMUM AND MAXIMUM LENGTH OF TRENCH

The Contractor shall prepare trench subgrade for sewers not less than 9 linear meters in advance of such sewer construction.

TRENCH BACKFILL

The Contractor shall do all backfilling necessary, or required, to satisfactorily complete the work, and he shall backfill all excavations to the elevations of the required subgrade or adjacent ground, as the case may be.

Backfilling shall not commence until after sewers placed in trench or similar excavations have been properly constructed, or installed as applicable, inspected, and if required, tested.

Backfill shall be placed in a manner not to disturb, damage, nor subject such facilities to unbalanced loads or forces.

Sand Bed.-All pipe sewers shall be constructed on a prepared or natural sand bed the width of which shall be at least the full width of the pipe, and not less than 100 mm thick below the pipe after installation.

Sand Backfill.-Backfill around all sewers from the bottom of the trench to a height 150 mm above the top of pipes for the full width of the trench shall be sand only. Sand backfill material shall be in accordance with the applicable requirements of Standard Specifications.

Backfill Above Required Sand.-Backfill material above the required sand shall be in accordance with applicable the Standard Specifications.

Backfill Layer

Each layer of backfill shall be compacted both during placement and following the withdrawal of sheet piling and lagging to the top of the layer being compacted. Withdrawal of sheet piles or other trench support systems shall be done such that voids are not created from loose material under the adjacent pavement entering the trench. After the placing of backfill has been started, the Contractor shall proceed as soon as practicable with densification. All sand backfill to be densified by water shall be jetted, unless flooding is specified or otherwise authorized by the Engineer. Flooding of sand will be prohibited where sewers might be damaged, or adjacent materials softened, by the applied water. The Contractor shall make his own determination that flooding or jetting will not result in damage. Any resulting damage shall be repaired at the Contractor's expense. Sand backfill jetted, flooded, or compacted by other approved means, shall be done in horizontal layers not more than 1.5 meters thick.

Jetting of backfill shall be done in accordance with the following requirements:

1. The jet pipe shall consist of a minimum of 25 mm diameter pipe to which a minimum 38 mm diameter hose is attached at the upper end. The jet shall be of sufficient length to project to within 300 mm of the bottom of the lift being densified.
2. The Contractor shall jet to within 300 mm of the bottom of the lift and apply water in a manner, quantity and at a rate sufficient to thoroughly saturate the thickness of the lift being densified. The jet pipe shall not be moved until the backfill has collapsed and the water has been forced to the surface.
3. Voids left by the removal of sheeting, piles and similar sheeting supports shall be immediately backfilled with clean sand which shall be jetted into place to ensure dense and complete filling of the voids.

All backfill other than sand shall be placed in horizontal layers not more than 200 mm thick before compaction, and each layer shall be satisfactorily compacted by mechanical means. Flooding or jetting, in this case, will not be allowed.

Compact each layer of backfill material to not less than 95 percent relative compaction as determined by ASTM Designation D1557.

INSTALLATION OF SEWER PIPES

Pipe sections of the sewers shall be ordered in short lengths, as necessary if "T" or "Y" branches will be used, in order that such branches will be located opposite or within 0.6 m down downstream of existing side sewer locations.

Pipe sewers shall be so constructed and the sections so installed that the sections of pipe laid together form a continuous uniform line of pipe with a smooth regular interior surface. Pipe shall be laid uphill from structure to structure. Each pipe shall be laid in the proper position, on a firm 100 mm deep sand bed, and shall have uniform support and bearing for its entire length.

Pipe sewers shall be laid in conformity to the prescribed lines and grades, which shall be obtained for each pipe by measuring from a tightly stretched line running parallel with the grade and supported over the center line of the sewer by bars placed across the trench. The pipe sections shall be tightly fitted together. All adjustments of pipe to line and grade shall be made by scraping away or filling in and tamping the earth under the body of the pipe, not by blocking or wedging up. Supporting blocks shall not be used under the pipe. Pipe shall not be laid within 100 mm of any rock or other rigid object.

The Contractor shall not lay pipe in water and shall use crushed rock or some other method approved by the Engineer to maintain an appropriately dry trench.

Crushed rock bedding for pipe sewers shall be uniformly graded from No. 4 to 19 mm sieve size. Compaction shall be obtained by shovel slicing, using care not to disturb the pipe. Jetting will not be allowed to get proper compaction of the crushed rock bedding.

MEASUREMENT AND PAYMENT

VCP sewer pipes will be measured in meters along center line of the pipes.

The contract price paid per meter for 300 mm vitrified clay sanitary sewer pipe shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing the pipe, complete in place, including structure excavation and structure backfill and connecting new pipe to existing or new facilities, including concrete collars, as shown on the plans, and as specified in these special provisions, and as directed by the Engineer.

10-1.54 SANITARY SEWER MANHOLES

PART 1.- GENERAL

SUMMARY

Scope.-This work shall consist of constructing precast concrete manholes complete with cones, frames, covers, gratings, asphalt pavement around the ring, steps, VCP stub inlets, excavating, lagging, backfilling, restoring pavement and other incidental work, necessary or required for a complete satisfactory installation, in accordance with the details shown on the plans and these special provisions.

Manholes shall be constructed to conform to the improved street surface. In unimproved areas if the ground surface is below the official grade, the manhole shall be constructed to conform to such official grade unless otherwise indicated on the plans; and if the ground surface is above the official grade, the manhole shall be so constructed that the internal diameter, at the proper elevation to conform to the official grade, is 610 mm inside diameter and shall be continued upward, with the same diameter, to conform to the ground surface.

REFERENCES

The regulatory requirements which govern the work of this Section include the following codes and standards:

- A. ASTM Designation: A615/A615M-01b - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- B. ASTM Designation: C478M Standard Specification for Precast Reinforced Concrete Manhole Sections [Metric]
- C. ASTM Designation: D4101-02a - Standard Specification for Polypropylene Injection and Extrusion Materials

PART 2 - PRODUCTS

Precast Concrete Sections.-Manholes shall be constructed of precast concrete sections in accordance with the requirements of ASTM "Standard Specifications for Precast Reinforced Concrete Manhole Sections", Designation C478M. Precast concrete manholes shall be supported on a cast-in-place concrete base.

Formwork.-

Lagging or shoring shall not be used as a surface against which concrete is placed.

Smooth forms accurate held on line and grade shall be used. Forms and centers may be made of either metal or timber. The surfaces of all timber forms that come in contact with the inside surfaces of sewer structures shall be laid with close joints and oiled with non-staining mineral oil.

Sharp corners shall be chamfered one inch, and 75 mm x 75 mm triangular fillets shall be used in all angles of formwork unless otherwise shown on the plans or directed by the Engineer.

Invert Forms.-

Inverts or sewers and sewerage structures shall be formed by the use of fixed and rigid forms when the invert radius is 0.6 meter or less. Inverts with a radius larger than 0.6 meter and smaller than 0.75 meter shall also be formed by the use of fixed and rigid forms unless the Engineer approves otherwise. Such approval will depend on the concrete's slump and its ability to satisfactorily form the invert shape by screeding. When fixed and rigid formwork is required, shaping the inverts with screeds or other means will not be allowed.

PART 3 - EXECUTION

Construction

The invert of structure, up to the key joint, shall be constructed first. The concrete shall be carefully and properly placed and vibrated. No traffic of any kind will be permitted on the invert for at least twenty-four hours after placing. Concrete for the sewer structures not on piles shall not be placed until at least forty-eight hours have elapsed after the placement of invert concrete.

Form Removal

The period of time and the strength of concrete required before the removal of forms shall be in accordance with the applicable requirements of the Standard Specifications. Unless otherwise specified, all formwork and trench support material shall be removed by the Contractor.

Finishing

Inverts of sewer structures shall be steel troweled to a smooth uniform surface.

Frames, Covers, and Grating

Cast iron frames, covers, and gratings shall be 610 mm inside diameter, full traffic type, as manufactured by Phoenix Iron Works, or approved equal as shown on the plans.

Each casting shall have its weight indicated thereon with white paint.

Care shall be exercised to cast the contact surfaces in a true plane and free from irregularities. These surfaces shall be machined or ground to insure uniform contact between frame and cover or grating.

Taper Cones.-The taper cone for precast manholes shall be of the eccentric type. The vertical wall of the cones shall be upstream or as otherwise directed by the Engineer.

Steps.-All steps for sewer structures shall be fabricated from approved Class 316 stainless steel or approved polypropylene conforming to Type II, Grade 16906, and in accordance with the requirements of ASTM D4101-02a with 50mm grade 420 steel reinforcement conforming to ASTM A615M, and in accordance with the details shown on the plans.

Adjustment of Manhole Frames and Other Castings.-The Contractor shall set and reset, as applicable, frames and casting of manholes in accordance with the Standard Specifications. Such resetting shall include the extending or shortening of cones, barrels or risers of such structures to adjust the casting to the required pavement elevation.

Asphalt Pavement Around Manhole Ring.-The Contractor shall construct minimum 75 mm asphalt pavement with 12.5 mm medium grading around the manhole ring in accordance with the details shown on the plans and applicable requirements of the Standard Specifications.

PAYMENT

The contract unit price paid for sewer manhole shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing sanitary sewer manhole, complete in place, including furnishing and installing manhole frame and cover, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.55 PAINT TRAFFIC STRIPE

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Traffic stripe paint shall conform to the requirements in State Specification No. PTWB-01.

The color of the painted traffic stripes shall conform to the requirements in ASTM Designation: D 6628-01.

Retroreflectivity of the paint traffic stripes shall conform to the requirements in ASTM Designation: D 6359-99. White painted traffic stripes and pavement markings shall have a minimum initial retroreflectivity of $250 \text{ mcd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$. Yellow painted traffic stripes shall have a minimum initial retroreflectivity of $150 \text{ mcd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$.

At the option of the Contractor, permanent traffic striping tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions may be placed instead of painted traffic stripes. Permanent tape, if used, shall be placed in conformance with the manufacturer's specifications.

If permanent tape is placed instead of painted traffic stripes, the tape will be measured and paid for by the meter as paint traffic stripe of the number of coats designated in the Engineer's Estimate.

10-1.56 PAVEMENT MARKERS

Pavement markers shall be placed in conformance with the provisions in Section 85, "Pavement Markers," of the Standard Specifications and these special provisions.

The Contractor shall furnish the Engineer certificates of compliance for the pavement markers in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Retroreflective pavement markers shall be marked as abrasion resistant on the body of the markers.

SECTION 10-2. (BLANK)

SECTION 10-3. LIGHTING AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Modifying lighting and electrical systems shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

The work to be done includes installation of new 2 kV, 4 kV, and 12 kV underground lines and removal of existing lines. It also includes the installation of temporary street lighting poles along new roadway and the installation of a new service equipment enclosure and transformer to replace the existing service transformer being removed. The Engineer will require continuous operation of the existing systems until new equipment is operational.

The work to be done, in general, under electrical facilities, shall consist of the following requirements, as shown in the plans and described elsewhere in these special provisions:

1. Install oil filled pad mount transformer as shown on the plans.
2. Install three phase service equipment enclosure as shown on the plans.
3. Install cables as shown on the plans.
4. Install equipment grounding system.
5. Install street lighting as shown on the plans.
6. Install conduit and pull boxes as shown on the plans.
7. Remove existing transformer and service equipment located in Building 213.
8. Install subsurface sectionalizing switch as shown on the plans.
9. Remove existing 2kV, 4kV, and 12 kV underground lines.

The Contractor shall coordinate work with Hetch-Hetchy Water & Power on the YBI utility relocation with the utility company and the Engineer. All YBI utility relocation work with Hetch-Hetchy Water & Power shall be completed and inspected prior to acceptance of the work.

The Contractor shall notify the Engineer and Hetch-Hetchy Water & Power for final termination of high voltage cable to substation by Hetch-Hetchy Water & Power.

The Contractor shall notify the Engineer and Hetch-Hetchy Water & Power for final connection of heater circuits to substation equipment by Hetch-Hetchy Water & Power.

10-3.02 COST BREAK-DOWN

Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these special provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3.

The cost break-down shall be submitted to the Engineer for approval within 15 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost breakdown shall include the following items in addition to those listed in the Standard Specifications:

- A. Transformers - each type
- B. Subsurface sectionalizing switch.
- C. Overhead cables - list each size and type.
- D. Removal of existing underground lines.

10-3.03 FOUNDATIONS

Reinforced cast-in-drilled-hole concrete pile foundations for traffic signal and lighting standards shall conform to the provisions in "Piling" of these special provisions.

10-3.04 SLIP BASE INSERTS

Slip base inserts, for installation between the lighting standards and the foundations, shall conform to the details shown on the plans.

The bottom slip base plate shall be welded to the bottom anchor plate before installation. The top slip base plate shall be drilled and tapped to accept the threaded studs as shown on the plans. The studs shall not be welded to the top slip base plate. The pitch diameter of the threaded holes shall conform to the requirements in ANSI Standard: B1.1, having a Class 2B tolerance. Threaded studs installed in the top slip base plate shall match the holes in the base of the lighting standard.

The optional cast steel plate shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

The combined bottom anchor plate and bottom slip base plate shall be bolted to the foundation. The top slip base plate, without the lighting standard attached, shall be bolted to the bottom slip base plate. Each high-strength bolt shall be torqued to 200 ± 10 N·m. After assembly of the insert, the lighting standard shall be erected and installed on the top slip base plate. During installation the lighting standard shall be properly supported to maintain proper alignment of the insert.

High strength bolts, nuts and flat washers used to connect slip base inserts shall conform to the requirements in ASTM Designation: A 325.

10-3.05 CONDUIT

Conduit to be installed underground shall be Type 3 unless otherwise specified. The conduit in a foundation and between a foundation and the nearest pull box shall be Type 1.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

Size Designation for Metallic Type Conduit	Equivalent Size for Rigid Non-metallic Conduit
21	20
27	25
41	40
53	50
63	65
78	75
103	100

When a standard coupling cannot be used for joining Type 1 conduit, a UL listed threaded union coupling conforming to the provisions in Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling, or concrete-tight set screw coupling shall be used.

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled with commercial quality concrete, containing not less than 250 kg of portland cement per cubic meter, to not less than 100 mm above the conduit before additional backfill material is placed.

After conductors have been installed, the ends of conduits terminating in pull boxes and service equipment enclosures shall be sealed with an approved type of sealing compound.

At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions" of these special provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

At other locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the "Trenching in Pavement Method."

10-3.06 PULL BOXES, SPLICES AND JUNCTION BOXES

Grout shall not be placed in the bottom of new or existing pull boxes.

In grade medium voltage pull box shall be pre-cast pull box, 2.6 m x 1.4 m. The box shall conform to all requirements in NEC, Article 370. Pull box cover shall be heavy traffic rated and shall read "High Voltage", permanently marked and readily visible.

Medium voltage cables shall only be spliced in pull boxes as shown on the plans, and as required to meet manufacturer's pulling tension requirements. A minimum of 6 m of cable shall be coiled in each pull box with 3 m of slack cable provided on each side of a splice. Cable splices shall be weatherproof, stress cones type, single conductor style. Splices shall not be pulled into conduits.

Splices shall be tagged with cable identification on permanent plastics marker tag. Cable identification will be provided by the Engineer.

10-3.07 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B".

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

15 kV cable shall be used for 2 kV, 4 kV and 12 kV underground lines.

15 kV CABLE

The 15 kV shielded single conductor power cable shall be 15 kV, 133 percent insulation rated power cable designed to operate at conductor temperatures of 90°C normal, 130°C emergency, and 250°C short circuit conditions as defined by ICEA S-93-639 (NEMA WC-78) and (UL) Standard 1072. The cable shall be suitable for installations above or below grade, indoors or outdoors, and in wet or dry locations. The qualifying cable shall be (UL) labeled as MV-105, Sunlight Resistant and for cable tray (CT) use in accordance with UL Standard 1072.

Conductors

The conductors shall be compressed, Class B stranded copper and shall be in accordance with the requirements of ICEA S-93-639. The copper conductors shall consist of all bare strands or tin-coated strands in the outer layer in conformance with the requirements in ASTM Designations: B 3, B 8 and B 33.

Conductor Shield

The conductor shield shall be an extruded, black-colored, non-conducting thermoset material in accordance with the provisions in Section 2.7 of ICEA S-93-639. The minimum average thickness shall be 0.5 mm.

Insulation

The insulation shall be a discharge resistant, ethylene propylene (EP) based compound and be listed by Underwriters Laboratories. The minimum average thickness of the insulation shall be 175 mils. The manufacturer shall perform the Insulation Corona Discharge Resistance Test (3.9.3.3 of ICEA S-93-639) tested in conformance with the requirements in ASTM Designation: D 2275-89, "Standard Test Method for Voltage Endurance of Solid Electrical Insulating Materials Subjected to Partial Discharges (Corona) on the Surface," and submit the results to the Engineer before acceptance of the cable.

Insulation Shielding

The insulation shielding shall consist of a nonmetallic conducting material extruded directly over the insulation and a 0.12-mm bare copper tape. The nonmetallic layer shall be black colored with properties and thickness conforming to the requirements of Table 4a of ICEA S-68-516-93-639 and Tables 14.2 and 14.3 of UL-1072. The layer shall be free stripping from the EP insulation. The 0.12-mm bare copper tape shall be helical applied with a 15 percent overlap, directly over the nonmetallic layer.

Overall Jacket

The overall jacket shall be extruded black-colored Polyvinyl Chloride (PVC) material with physical properties and thickness in accordance with Section 4.4.5 and Table 4-6 of ICEA S-93-639 and shall be surface printed as required by UL Standard 1072.

Production Testing

Production testing shall consist of the following:

- a. Continuous DC spark testing of the non-conducting stress control layer prior to extrusion of the EP insulation.
- b. Mooney Viscosity, Scorch Viscosity, and Specific Gravity of each batch of the EP insulation prior to extrusion.
- c. AC Voltage Withstand test for a 5-minute duration, of each finished cable at 35 kV.
- d. Volume resistance of all insulated conductors and metallic shields.
- e. Dimensional verification of all extruded layers.
- f. Absence of water in conductors and interfaces confirmed.

Cable Accessories

The manufacturer of the splices and terminations shall have a minimum of 15 years specialized in manufacturing of heat shrinkable cable accessories. The manufacturer of the splices and terminations shall be the Raychem Corporation, Pirelli, Elastimold, 3M or approved equal.

The cable splicer shall have a minimum of five years experience and be certified by the splice and cable termination manufacturer. The Contractor shall provide the Engineer documentation of the cable splicer's experience and qualifications to be approved by the Engineer.

Cable Terminations

The cable terminations shall meet IEEE 48, Class 1, for heat-shrinkable cable terminations in kit form, capable of properly terminating cables specified in these special provisions. Terminations for single-conductor cables shall consist of heat-shrinkable radiation crosslinked high dielectric constant linear stress relief material and heat-shrinkable radiation crosslinked non-tracking outer insulation. Terminations shall contain a high relative permittivity electric stress relief mastic for insulation shield cutback treatment and a heat-activated sealant for environmental sealing.

In addition to the above requirements, three-conductor kits shall contain heat-shrinkable components to seal the cable jacket, phase conductors, ground wire and re-jacket phase and ground conductors.

Cable Splices

The cable splices shall meet IEEE 404, for heat shrinkable splices in kit form, capable of properly splicing cables specified in these special provisions. Cable splicing kits shall contain all necessary components to reinstate primary cable insulation, metallic shielding and grounding systems and overall jacket to the equivalent of the cable itself. Splices shall be of a uniform cross-section and shall consist of heat-shrinkable radiation crosslinked insulation. The outer insulating layer shall be bonded to a conducting layer for shielding. The splice shall be re-jacketed with a heavy-wall, heat-shrinkable sealant lined sleeve to provide a waterproof hot melt adhesive seal. Splices shall contain heat-shrinkable radiation cross-linked high dielectric constant linear stress relief material. Splices shall contain a high relative permittivity electric stress relief mastic for insulation shield cutback treatment and a heat-activated sealant for environmental sealing. Splicing kits shall allow for splicing cables with different types of insulation, conductor sizes, and shielding construction. Splicing kits shall accommodate commercially available standard connectors.

Splices of high voltage cable shall be avoided. Where necessary, because of constructibility reasons, splice locations of high voltage cable shall be approved by the Engineer. Splices of high voltage cables shall be scheduled so that the length of cable between splices is approximately 400 meters or longer. All 15 kV splices shall be enclosed on a 15 kV splice box. Cable splices shall be provided at the construction boundaries.

Cable End Sealing Caps

The end sealing caps shall be constructed using heat-shrinkable crosslinked polymeric capable of sealing cables and pre-coated with a heat activated sealant.

DC High Potential Test

The Contractor shall perform DC high potential test of each conductor in accordance with NEMA WC 5.

15 kV Armored Shielded Cable

The 15 kV armored shielded cables shall be installed during staging as an alternative to the wires in the conduit system. The individual conductor of the armored shielded cable shall conform to the 15 kV cable requirements as specified elsewhere in these special provisions. The cable shall have a continuous corrugated welded aluminum sheath encasing the cable core per UL 1072 and UL listing E-38916, that is recognized as a grounding conductor by the NEC. The cable shall have a sheath providing complete protection against moisture, liquid and gasses and shall have excellent mechanical strength. The sheath

shall be protected with a low temperature polyvinyl chloride jacket in accordance with UL 1072 to protect the cable against chemical attack.

OVERHEAD CABLE

Overhead cables shall be Type USE. Conductor for overhead cable shall be uncoated copper Class B solid per ASTM-B-3. Insulation to meet all requirements of ICEA S-68-516, NEMA WC-8 and UL Standards 44 and 854.

10-3.08 BONDING AND GROUNDING

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications and these special provisions.

Bonding jumpers in standards with handholes and traffic pull box lid covers shall be attached by a UL listed lug using 4.5-mm diameter or larger brass or bronze bolts and shall run to the conduit or bonding wire in the adjacent pull box. The grounding jumper shall be visible after the standard has been installed and the mortar pad and cap have been placed on the foundation.

Standards without handholes shall have bonding accomplished by jumpers attached to UL listed ground clamps on each anchor bolt.

For slip base standards or slip base inserts, bonding shall be accomplished by jumpers attached to UL listed ground clamps on each anchor bolt, or a UL listed lug attached to the bottom slip base plate with a 4.5-mm diameter or larger brass or bronze bolt.

Equipment bonding and grounding conductors are required in conduits, except when the conduits contain combinations of loop lead-in cable, fiber optic cable, or signal interconnect cable. A No. 8 minimum, bare copper wire shall run continuously in circuits, except for series lighting circuits, where No. 6 bare copper wire shall run continuously. The bonding wire size shall be increased to match the circuit breaker size in conformance with the Code, or shall be as shown on the plans. Conduits to be installed for future conductors, may omit the copper wire.

Bonding of metallic conduits in metal pull boxes shall be by means of bonding bushings and bonding jumpers connected to the bonding wire running in the conduit system.

10-3.09 SERVICE

Continuous welding of exterior seams in service equipment enclosures is not required.

SERVICE EQUIPMENT ENCLOSURE (MODIFY)

Circuit breakers used as service disconnect equipment shall have a minimum interrupting capacity of 42 000 A, rms, for 120/208 V(ac) service.

Service equipment is similar to Type III-CF except equipment is to be for 120/208 V(ac), three phase, four wire system. The service pedestal shall meet all requirements of Hetch-Hetchy Water & Power.

PAD MOUNTED TRANSFORMER

Liquid filled transformers shall conform to ANSI C57.12.27, be three phase, pad mounted, self-cooled transformer unit. Oil used in liquid filled transformers shall conform to IEEE C57.106.

The transformer tank and terminal compartment shall be bolted together to form an integral outdoor weather-resistant type unit. The terminal compartment shall be completely enclosed with one high voltage and one low voltage compartment door. The compartment doors shall use no bolts, screws, or other fastening devices which are externally removable, with the exception of hexhead bolts for security, that provide access to the energized parts within the enclosure. The enclosure shall be tamper-resistant design meeting the requirements of ANSI C57.12.28-1988, "Padmounted Equipment-Enclosure Integrity for Switchgear and Transformers".

Full height, air-filled incoming and outgoing terminal compartments with hinged doors shall be located side by side, separated by an isolating barrier. The hinged doors shall be attached with stainless steel hinges and hinge pins and incorporate a three point latching mechanism operated by the low voltage door handle, with door stops on both doors to secure doors during servicing. To facilitate making connections and permit cable pulling, the doors and compartment hood shall be removable. A removable door sill shall be provided to permit rolling or skidding the unit into place over conduit stubs in foundation.

The high voltage compartment shall be on the left, and shall be accessible only after the door to the low voltage compartment has been opened. The high voltage compartment shall enclose the high voltage bushings or bushing wells and provide for incoming cable from below. The high voltage equipment shall be arranged for a primary selective radial feed as shown on the drawings.

The unit shall be equipped with the following standard accessories:

1. A weather cover over the enclosure is to be provided with additional hold-down hardware to secure it more firmly to the enclosure.
2. Four lifting hooks.
3. Bolted-on terminal compartment minimum of 457 mm deep with removable front sill.
4. Hinged, lift-off cabinet doors.
5. Interlocked (hex-head) bolt/padlock handle to operate a cam assembly which is to be part of the three point door latching mechanism.
6. Tank ground pads (one in high voltage pad and one in low voltage pad).
7. Steel high/low voltage compartment barrier.
8. Two 9.5 mm hexhead bolts which must be removed from the steel high/low barrier before the HV door can be opened.
9. Nameplate – A durable metal nameplate made of corrosion-resistant material and conforming to ANSI/IEEE C57.12.00-1980 affixed to each transformer.
10. Oil level/fill plug and oil drain plug.
11. Self-actuating pressure relief device to relieve slow pressure build-up shall be provided that will automatically vent when pressure reaches 69 kPa ±13.8 kPa and recluses when pressure falls to 41.4 kPa.
12. Removable neutral ground strap.
13. Five-legged core and coil assembly suitable for grounded WYE-grounded WYE connections, DELTA-ground WYE connections or DELTA-DELTA connections as required.
14. Handhole cover bolted onto tank top, protected by weather cover.
15. Tap changer handle for de-energized operation only.
16. Drain valve with sampling device.
17. Liquid level gauge.
18. Dial type thermometer.
19. Provision for pressure vacuum gauge.

High Voltage Termination

The high voltage termination shall occur by providing a dead front panel. The dead front panel shall have externally clamped high voltage epoxy bushing wells with load break 200 A inserts. The Contractor shall provide load break elbows for the size and type cable shown on the plans.

High Voltage Switching

High voltage switching shall be by oil immersed switching and conform to the following:

1. Designed for padmounted transformers enabling an operating person to quickly isolate a line fault in a radial feed system, while maintaining full service continuity. (Under Bid Alternate No. 2 it would be a primary selective radial feed system).
2. Available in 200 A, hook stick operable. Available at the following ratings, as defined by: ANSI Standard C37.72, 1987; American National Standard Requirements for Manually operated, Dead Front Padmounted Switchgear with Load Interrupting Switches and Separable Connectors for Alternating-Current Systems.
3. The electrical characteristics of switch:

Ratings	200 A
Maximum Voltage	15.5 kV 10 (Line-Ground) 125 kV (Impulse Withstand Voltage)
Continuous and Interrupting Current	200 A
Momentary & Making Current	12 kA (Sym) 19.2 kA rms (Asym)
60 Hz Withstand Voltage	Design: 60 kV Production: 40 kV
Corona Extinction Voltage	19 kV rms Mechanical Operations: 500 (plus)

High Voltage Fusing

The high voltage shall include full range current limiting fuses consisting of a general purpose (CLT), fuse mounted in a loadbreak draw-out dry fuse well. The current limiting fuse shall be designed to limit both the current magnitude and the energy associated with low impedance faults.

Fuses shall have continuous current ratings sized per the manufacturer's recommendation for the indicated kVA, impedance and primary voltages.

High Voltage Surge Arresters

The transformer shall be designed with fusible switch radial feed with dead front arresters.

Low Voltage Terminations

The low voltage compartment shall be arranged for cabling from below. Three line bushings and one insulated neutral bushing with an externally removable ground strap shall be supplied. The bushings shall be supplied with spade type terminations and standard NEMA spacing and drilling.

Externally clamped low voltage epoxy bushings with threaded copper studs and NEMA four hole rotatable spades.

Transformer Testing

Tests shall be made on all transformers. The numbers shown do not necessarily indicate the sequence in which the tests shall be made. All tests shall be made in accordance with the latest revision of ANSI Standard Test Code C57.12.90, where applicable. The following testing shall be performed:

1. Transformers shall pass the following routine electrical tests:
 - (a) Ratio Test.
 - (b) Demagnetization Test.
 - (c) Applied Voltage Test of High Voltage.
 - (d) Applied Voltage Test of Low Voltage.
 - (e) 400 Hz Induced Voltage Test.
 - (f) Iron loss and Exciting Current Test.
 - (e) Impedance and Load loss Test.
 - (g) Full Wave Impulse Test.
2. Transformers shall pass a Mechanical Leak and Pressure Test on tank and coolers.
3. Design tests are not required to be repeated unless the design of the transformer is changed so as to modify the reliability of predicated results. The following ANSI basic design tests are to be made on a sufficient number of transformers and ratings to demonstrate compliance with these standards:
 - (a) Short circuit.
 - (b) Audible sound level.
 - (c) Temperature rise.
 - (d) Power factor.

Certified copies of actual loss data for the standard tests and test data on basic design shall be furnished to the Engineer and Hetch-Hetchy Water & Power.

Installation

The equipment pad shall be set for at least 21 days before setting transformer unit.

Equipment and Neutral Grounding: The system neutral ground shall be made at transformer neutral bushing only. The neutral grounding shall not be grounded at the service switchboard. The pad ground grid and the in-building ground shall be tied together with conductor(s) run with the service feeder as shown in the diagram on the plans.

Setting, Leveling, and Fastening Equipment: The transformer unit shall be set on leveled nuts on the pad bolt inserts with a crane (use of forklift for this purpose is prohibited). After proper setting of the transformer complete the bolting of the unit. Grout under transformer base the entire perimeter of the transformer tank and the primary-secondary compartments. After the grout has set, lower insert bolt nuts 1/4 turn and tighten fastening nuts.

All aspects of the transformer installation must meet the requirements of and be approved by the Engineer and Hetch-Hetchy Water & Power.

Marking and Identification

The Contractor shall affix warning signs centered on the outside of the primary compartment door, 100 mm to 150 mm above the transformer base, at each transformer, with four 6 mm diameter bronze rivets.

THREE PHASE MANUALLY OPERATED LOAD-INTERRUPTING FUSED SWITCH ASSEMBLY

This specification applies to a three-phase, group operated, 60 Hz, subsurface, load interrupting switches with ratings of 200 A and 15.5 kV, and utilizing separable insulated connectors mounted on the bottom.

When the following standards referred to in this document are superseded by a revision, the latest revision shall apply. Switch shall meet all requirements of the following:

C37.71-1984 ANSI Requirements for three-phase Manually Operated Subsurface Load-Interrupting Switches for Alternating-Current Systems, or latest version.

ANSI/IEEE Std 386-1977, Separable Insulated Connectors for Power Distribution Systems above 600 V, or latest version.

The definitions of terms contained in this specification, or in other standards referred to in this document, are not intended to embrace all the legitimate meanings of the terms. They are applicable only to the subject treated in this specification.

Bus (as used in this specification).

A three-phase junction common to two or more ways.

Subsurface Switch.

A submersible switching assembly suitable for application in a below-grade enclosure that does not allow space for personnel access and is subject to flooding.

Surface Operable.

A term indicating that the switch and its accessories are operable from above grade.

Way

A three-phase circuit entrance to a switching assembly.

Switched Way.

A way connected to the bus through a three-pole, group-operated switch.

Tapped Way.

A Way solidly connected to the bus.

Load interruption arcing shall take place in a vacuum to keep insulation clean and system switching transients to a minimum.

Insulating medium shall be 10C transformer oil.

Nominal Voltage of 15 kV.

Maximum Design Voltage of 15.5 kV.

Basic Insulation Level (BIL) phase-to-phase and phase-to-ground 125 kV.

Basic Insulation Level (BIL) across open contacts 95 kV.

One Minute Withstand (60 Hz) of 34 kV.

Continuous Current (Maximum in Amps) 50 at 15.5 kV.

Load switching 600 Amps.

Fused way continuous current, 50 A at 15.5 kV.

Switch Momentary & Make & latch (Asymmetrical Amps) 20,000.

Switched way with current limiting fuses, 50,000 A symmetrical.

Number of 600 A full-load switching operations 10,000.

The switch shall utilize vacuum interrupters having load break capabilities and shall have minimum life of 10,000 full 600-A interruptions without changing insulation, relieving pressure or replacing parts.

Fusing

Fusewells shall be canister type utilizing drywell fuse types. The design shall eliminate the possibility of fuse removal under load.

The fuse assembly shall be designed to eliminate the possibility of removing the fuse with the switch handle in the closed position. The design shall include a physical barrier that moves out of the fuse removal path with the opening of the switch handle.

The fusewells shall accommodate full range fuse combinations covering all currents up to and including 50 A continuous at 15.5 kV.

Provide with 6 A, 15 V x-limited current limiting fuse.

Bussing

All internal switch bussing shall be copper.

Grounding provision

One stainless steel grounding pad with a 12.7 mm 14 NC hole, 11.1 mm deep, shall be provided for each way and shall be located near the center bushing of each way.

Manual Operating Provisions

Manual operating handles shall move in to close and out to open. The direction of operation shall be apparent.

Manual operating handles shall be located where they can be operated either to open or to closed positions from above with standard live-line tools. The force required to operate the handle shall be such that one man in a standing position can readily operate it without standing directly below the switch.

The switch mechanism shall be designed so that operation does not require any special skills, and the closing and opening speeds of the contacts are independent of the speed at which the operating handle is operated.

Manual operating handles shall be capable of being padlocked in both the open and closed positions.

Switch Operating Mechanism

The switch shall be equipped with an internal operating mechanism design so that speed of opening and closing of the interrupter contacts will be independent of the external operator. All contacts of the three phases shall be operated simultaneously with no possibility of single phasing due to teasing of switch handle.

The switch shall be quick-make, quick-break type. Contacts shall be stable in open and closed positions without use of mechanical latches, sear pins or detents.

Position Indicators

Switches shall be provided with position indicators or other suitable means that clearly and positively indicate the open and closed positions of the contacts.

The indicators shall be visible from above.

Insulating Medium Quantity Indicators

Procedures or devices that require exposing the insulating medium to the outside environment shall not be used.

Provision shall be made for personnel to readily determine safe insulating liquid level with the switch energized.

Low Insulation Level indication device shall have no moving parts and shall display "LOW OIL" with white letters against a red background when insulation falls below safe level.

Tank Construction

The tank and all appurtenances shall be made of AISI 304 stainless steel completely welded using AISI 308L filler to maintain corrosion resistance properties.

All bushings to be welded and mounted on the top of the tank.

All tank penetrations double "O" ring sealed.

Switch tanks shall be equipped with mounting provisions (such as support rails) that shall include provisions for anchoring the tank to the ground. Hot dip galvanized 12-inch high support stand furnished with the switch suitable for bolting to the pad.

Lifting lugs of AISI304 stainless steel shall be welded to the tank so that the switch will remain level when being lifted. The lugs shall be designed and located to avoid interference between lifting slings and any attachments (bushings, switch handles, etc.).

Termination

The switch bushings shall accommodate cable termination in accordance with ANSI/EEESd 386-1977[3] or latest revision.

Bushing Designation

The switch bushing shall be identified and legibly marked adjacent to each bushing with the appropriate phase designation, using a nameplate of stainless steel.

Nameplate

A nameplate of stainless steel shall be provided. The nameplate shall be tack welded securely to the top of the tank by means of AISI 308L stainless steel filler. All letter, schematics and numbers shall be photo engraved on the nameplate. The nameplate shall contain at least the following information:

The word Switch.

Name of manufacturer.

Date of manufacturer (month and year, for example, 1-90).

Serial Number.

Model number or style number.

Rated maximum voltage.

Rated impulse withstand voltage.

Rated continuous current.

Rated load interrupting current.

Rated momentary current.

Rated making current.

A three-line bushing-oriented schematic diagram, using standard symbols.

Total weight (including insulating medium).

Type and quantity of insulating medium.

Testing

Tank: The finished tank will be pressurized to 48.3 kPa and tested for leaks using suitable leak detection methodology.

Electrical: AC hi-pot at 34 kV for one minute phase-to-phase, phase-to-ground, and across open contacts on all ways.

Continuity test all circuits.

Shipping Requirements

Preparation: The switch shall be completely assembled, include the correct amount of insulating medium.

Switches shall be properly packaged and braced to prevent damage during shipment.

Documentation: Instructions and checklists for the inspection, installation and maintenance of the switch shall be provided.

Field Inspection: Upon receipt of this equipment a thorough inspection should be performed. If any damage is found, a claim should be filed immediately with the transportation company that delivered the equipment. Your manufacture representative should also be contacted.

With the equipment unpacked, a thorough inspection can be performed.

Check liquid level gage (see Section 5A). Check to see that there is no leakage of dielectric fluid from switch tank. If any liquid is found leaking from the switch tank, call the manufacture Engineering factory immediately. Inspect the switch tank face for any damage to bushings, parking stands, switch handles, etc.

Handling: This equipment is liquid filled and quite heavy. It should be handled with great care by trained personnel using well maintained material handling equipment in good condition and of adequate capacity. Check the switch unit nameplates for total weight in kilograms before selecting handling equipment. As long as the switch unit is still strapped to its pallet it may be moved by a forklift. Once the unit has been unbolted it must be moved by crane. Lifting lugs have been provided on both sides of the switch body for an even, level lift using a sling and crane.

Switch unit should be lifted slowly and smoothly to avoid shock loading the switch unit or lifting equipment. Note: At no time should anyone be allowed under suspended load.

Storage: Although this equipment is designed for outdoor use, sheltered storage should be provided to preserve its "as new" appearance. Prolonged storage in direct sunlight and extreme heat can subject the unit to high internal pressures. Bushing covers are provided with each new unit, these covers should be used to protect the bushings from chips, scratches and oxidation whenever the unit is being stored.

Installation: The switch is shipped from the factory ready for installation. Provide unit with a hot dip galvanized mounting stand. Installation is accomplished by simply bolting the switch and stand into properly prepared vault. It is very important to have this equipment securely bolted down or it can float when fully submerged. It is also very important to have the switch and stand properly grounded. Ungrounded or improperly grounded equipment can be subject to Galvanic Corrosion.

Installation and Termination of Cables

Cables should be clearly marked and trained to their appropriate bushing or bushing well. If at all possible, sufficient extra length should be provided on each cable to allow for easy removal, parking or re-termination in the future.

Depending on the switch bushings provided on the switch unit, 200 ampere connectors will be required. The cables should be terminated and attached to the switch unit using submersible connectors only, Elastimold or equal, in accordance with the instructions provided by the manufacturer.

Have mountings and terminations checked and approved before energizing this equipment.

Testing

This equipment shall receive an AC hi-pot test based on B.I.L rating prior to shipping, at the following levels:

kV BIL rating across open contacts shall be: 95 -- 125 -- 150.

Applied AC hi-pot voltage kV duration for:

Phase to phase: 36/1 min. -- 42/1 min. -- 50/1 min.

Phase to ground: 36/1 min -- 42/1 min. -- 50/1 min.

Across open contacts: 36/1 min -- 42/1 min -- 50/1 min.

This equipment may be given an AC hi-pot to these levels after installation. For DC hi-pot test on cables, the cables should be disconnected from the switch unit and parked per your standard procedures. This is recommended because the vacuum contacts can emit sufficient microamperes during DC high potential testing to give an improper indication of actual cable installation leakage.

10-3.10 NUMBERING ELECTRICAL EQUIPMENT

The numbers and edge sealer shall be placed on the equipment where designated by the Engineer.

Where new numbers are to be placed on existing or relocated equipment, the existing numbers shall be removed.

Reflective numbers shall be applied to a clean surface. Only the edges of the numbers shall be treated with edge sealer.

Where shown on the plans, 5-digit, self-adhesive equipment numbers shall be placed for all electroliers, soffit lighting, sign lighting, and service pedestals. On service pedestals, the numbers shall be placed on the front door. On electroliers, the numbers shall be placed as shown on the plans.

10-3.11 LUMINAIRES

Ballasts shall be electronic (where available), autotransfer or high reactance type, when electronic ballasts are not available.

10-3.12 SOFFIT AND WALL LUMINAIRES

A No. 7 pull box shall be installed adjacent to each soffit luminaire as shown on the plans.

10-3.13 PHOTOELECTRIC CONTROLS

Contactors shall be the mercury type.

10-3.14 SITE SECURITY AND CANOPY LIGHTING

Site security and canopy lighting shall include lighting, camera, remote access pedestal (with face, badge and card reader and voice communication to the security console in Building 22), a second pedestal (with intercom which connects to the security console in Building 22) and all other support equipment for a fully operational systems as shown on the plans and in conformance with these special provisions.

Materials List and Drawings

A list of materials which the Contractor proposes to install for the site security and canopy lighting systems together with the drawings and other data shall be submitted to the Engineer in conformance with the provisions in Section 86-1.04, "Equipment List and Drawings," of the Standard Specifications.

The working drawings shall include wiring diagram for site security and canopy lighting systems showing service and connection details. Proper placement, mounting height and orientation of the equipment and shall conform to the manufacturer's requirements for the system provided.

Before the completion of the contract, but after approval of the operational site security system, one set of the approved detailed information and diagrams shall be placed in a heavy-duty plastic envelope. The envelope shall be attached securely to the inside of the guard house or at a convenient location designated by the Engineer.

The Contractor shall be responsible for the compatibility and adjustment of components as necessary for the successful operation of the completed installation.

Requirements

Lighting will be mounted to the underside of the canopy as shown on the plans.

The camera shall be mounted under the canopy to record all entry into the vehicle gate and be comprised of a pan and tilt zoom camera and power supply. The following are the minimum requirements for the camera:

- A. Pan and tilt zoom camera: surface mounted under canopy with 18X zoom feature, NTSC video. Voltage to be 24 V(ac). Provide with outdoor rated power supply, 120 V(ac) to 24 V(ac).
- B. Camera: Kalatel Cyber Dome: Kalatel KTA-HE3-H1C, or equal.
- C. Power Supply: Kalatel KTP-24C or equal.
- D. Cables as required.

A remote access pedestal at the entry gate shall contain a face and badge reader, card reader as well as voice communication to the security console in Building 22. The face and badge reader connects to vehicle gate and shall open the gate when signaled from the security console. The card reader shall open the gate automatically. Voice communication shall be possible without pressing a switch except for "ringing" the distant end. The following are the minimum requirements for the remote access pedestal:

- A. Face Camera shall be color with high resolution: Kalatel # KTC215C, Pelco #CC3700H-2 or equal with 13VD3-8 auto iris lens, or equal.
- B. Badge reader and voice communicator: Kalatel #KTR-11C with black and white camera, with 13VD3-8 auto iris lens, or equal.
- C. Pedestal: Kalatel # KTR-91 or equal.
- D. Card Reader: Secura Key Entacomp #265A with power supply, Kalatel #KTP-24C, outdoor rated.
- E. Weatherproof Head: Katalael #KTR-90 or equal.
- F. Cables as required.

A separate pedestal shall contain an intercom which connects to the security console in Building 22. The following are the minimum requirements for the separate pedestal:

- A. Intercom: tamperproof, heavy duty construction and compatible with the other site security equipment, recommended by the site security manufacturer for the attended application and approved by the Engineer in writing prior to ordering.
- B. Pedestal: Kalatel # KTR-91 or equal.
- C. Cables as required.

The following equipment shall be located at the security console in Building 22:

- A. Data signal distributor shall be installed at the security center to allow communication with all of the camera receivers and face badge readers (new and existing) in a star configuration. Kalatel KTD-83.
- B. DTMF Signal Merger shall allow for multiple DTMF call inputs so that both new and existing Face/Badge readers can operate simultaneously. DTMF Signal Merger shall be Kalatel # KTD-86 or equal.
- C. Cables as required.

Low voltage cables shall be either 18 or 22 AWG, twisted pairs as required.

Video cables shall be R59/U coaxial.

Audio cable shall be 18 AWG, 4 twisted pair, shielded.

Manufacturer's Requirements

The manufacturer of the site security system shall be registered and in compliance with ISO 9001. In addition, the manufacturer shall be able to support the Contractor through training, demonstrations, site surveys and technical assistance as needed to meet the required site security system requirements as defined in these special provisions.

Certificate Of Compliance

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer, in conformance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall certify that the microwave vehicle detection sensor system comply with the requirements of these specifications. The certificate shall also include a copy of all test reports on the installed final configuration of the site security system reviewed and approved by the manufacturer.

10-3.15 DISPOSING OF ELECTRICAL EQUIPMENT

Ballasts and transformers and fluorescent and mercury lamps shall be disposed of in conformance with California Department of Health Services Regulations set forth in Title 22, Division 4, Chapter 30, of the California Code of Regulations.

Full compensation for hauling, stockpiling, and disposing of fluorescent tubing and mercury lamps shall be considered as included in the contract price paid for the electrical item involved and no additional compensation will be allowed therefor.

10-3.16 PAYMENT

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

The contract lump sum price paid for lighting and electrical system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in lighting and electrical system, complete in place, including testing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Site security and canopy lighting will be paid for on a lump sum basis.

The contract lump sum price paid for site security and canopy lighting shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in site security and canopy lighting, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

SECTION 11. (BLANK)

SECTION 12. PREFABRICATED GUARD HOUSE AND CONCRETE CANOPY

12-1.01 PREFABRICATED GUARD HOUSE

PART 1.-GENERAL

Scope.-This work shall consist of furnishing and installing one Prefabricated Guard House, complete with reinforced concrete slab foundation, reinforcing, fasteners, anchors and attachment devices including aluminum doors with hardware and accessories, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

RELATED WORK.-

Attention is directed to the provisions in "Cast-In-Place Concrete," of these special provisions for the construction of reinforced concrete slab foundation.

Attention is directed to the provisions in "Lighting and Electrical Systems," of these special provisions for cables and conduits.

REFERENCES

General.-The regulatory requirements which govern the work of this section include the following governing codes:

- A. California Code of Regulations (CCR), Title 24, California Building Code.
- B. National Electrical Code (NEC): Applicable Regulations.
- C. Underwriters Laboratories, Inc. (UL): Applicable Listings.

SUBMITTALS

Other Installations.-Provide locations and owners of three similar buildings that have been in service more than three years. This will allow the Engineer to inspect on site and obtain a statement from the owners on the quality of workmanship (fit and finish).

Working Shop Drawings.-Submit copies of shop drawings as required for the building required for this project. Drawings shall include elevations, section, floor plan, electric schedule, service entrance locations, and anchor clip detail.

Color Charts.-Submit color charts illustrating available colors and patterns for specified finishes shall be submitted to owner for prompt selections.

O&M Instructions.-Submit manufacturer's operation and maintenance instructions for Mechanical and Electrical appliances/systems furnished and installed in connection with the prefab attendant booth.

Warranty.-In addition to the guaranty provided elsewhere in the contract, furnish a full one-year warranty on the entire prefab attendant booth, beginning with the completion of the Contract. The warranty shall include, at no additional cost to Caltrans, furnishing of parts and service on-site where the booth is located to repair or replace any part of the booth that fails because of a manufacturing defect while in use.

QUALITY ASSURANCE

Prefabricated Guard House shall be covered by a one-year written warranty.

The structure shall be the product of a manufacturer with a minimum of 30 years-documented experience in the design and fabrication of portable buildings.

Prefabricated building by manufacturers other than the one approved shall submit sufficient data to enable approval to be given. As a minimum: Design drawings and /or calculations, applicable certifications, catalog information, and color samples showing equal range of variety.

Electrical devices installed within the prefabricated building shall be UL listed. Factory installed wiring system shall bear UL Classification insignia certifying compliance with the National Electrical Code.

Adherence to applicable portions of state and local building codes is the responsibility of the Contractor.

PART 2.-PRODUCTS

General Requirements.-The booth shall be double round, completely pre-assembled, pre-finished and pre-wired, with insulated walls and roof, one entry door with hardware, shelf, treadplate floor finish, interior fluorescent light, electric outlets, and 120/240 V load center.

Construction.-Building shall be of welded steel tube construction, portable type, with painted stainless steel exterior surfaces.

Floor Area.-1.524 m by 2.743 m.

Building height.—As shown on the Plans.

Design Loads.-244.1 kg/m² live load, 146.5 kg/ m² wind load.

Counters.-Two Plastic laminated.

Doors.-Two, Sliding.

Heating Units.-One, HVAC unit.

Electrical Equipment.-Two electric gate operators, telephone, one other communication conduit to the booth, and light fixtures at the canopy.

Acceptable manufacturers.-Subject to contract compliance, acceptable manufacturer's shall be Mardan Fabricators, 222 S. W. 33rd Court, Fort Lauderdale, FL 33315, Model Omni Series, or B.I.G. Enterprises, Inc., 9702 East Rush Street, South El Monte, CA 91733, or equal.

Wall Construction.—Composite wall panels of 1.6 mm stainless steel 304 exterior wall with 38.1 mm rigid insulation providing a minimum "R" factor of 7; interior finish pre-finished white 1.27 mm aluminum sheet laminated to 12.7 mm exterior grade plywood.

Structural Frame.—51 mm by 51 mm welded steel tubing concealed in walls and floor, formed for accuracy and quality according to booth design and dimensions; no exposed fasteners.

Finish.—All exterior surfaces coated with two coats chemical and graffiti resistant DuPont IMRON© polyurethane enamel. Color as selected by architect/owner from manufacturer's standard color chart.

Roof.—Composite 76.2 mm thick panel of rigid polyurethane insulation with stainless steel 304 0.81 mm sheet top and bottom, providing an "R" factor of 19. Drain scupper provided for water runoff. Overhang roofs available as an option.

Floor.—Aluminum treadplate floor finish over weather protected 19.05 mm exterior grade plywood. Floor supports of structural 3.175 mm aluminum tube welded to frame as integral part of the entire framing system. Included are pre-engineered interior anchor points in floor for concealed anchoring.

Doors.—Two heavy-duty stainless steel constructed doors, top-suspended, with high security mortise type hook-bolt lock. Door shall be fully weather-stripped. Single-hung window or fixed vision window provided in upper half of door utilizing 6.35 mm tempered safety glass. Doors shall be top suspended on steel no-maintenance ball bearing rollers in steel track with high security pocket jamb, heavy duty hardware, and keyed lock.

Glazing.—All flat windows shall be 6.35 mm tempered safety glass. Curved windows shall be minimum 4.762 mm mar-resistant Lexan MR5 (or equal).

Counter.—Two plywood counters covered with plastic laminate per drawings. Locking cash/storage drawer optional. Counter color to match interior booth color.

Electrical.—All wiring to meet NEC standards; all components shall be UL listed. System voltage shall be 120/240 Volt, 60 Hz, single phase, 3 wire. Standard lighting shall be two-tube 40 W fluorescent fixtures, ceiling mounted with wraparound acrylic lens diffuser. Duplex receptacles and light switch mounted as required per drawings. Roof-mounted HVAC (providing 14,240 kJ cooling / 5,908 kJ heat) or wall-mounted HVAC (size and output varies) provided as optional accessories. All electrical components pre-wired in surface-mounted 12.7 mm EMT conduit to circuit breaker panel.

Booth shall be modified for Handicap Accessibility.

PART 3.-EXECUTION

INSTALLATION

Install Prefabricated Guard House as indicated and in accordance with the approved shop drawings and the manufacturer's installation instructions and recommendations.

MEASUREMENT AND PAYMENT

The contract lump sum price paid for Prefabricated Guard House shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Prefabricated Guard House, complete in place and ready to operate, including reinforced concrete slab foundation, all furnishings, fixtures, appliances, doors and hardware, mechanical and electrical equipment and systems, utilities hook-up, and the like, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

12-1.02 CONCRETE CANOPY

This work shall consist of construction of concrete canopy entrance including all columns, footings, concrete slab for the curb islands, roof slab, parapet, roof drain, and galvanized roof drain and overflow drain pipes, complete, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Attention is directed to the provisions in Section 19, "Earthwork," and Section 54, "Waterproofing," of the Standard Specifications, and "Cast-In-Place Concrete," and "Falsework," of these special provisions.

RIGID ROOF INSULATION

Scope.-This work shall consist of furnishing and installing rigid roof insulation in accordance with the details shown on the plans and these special provisions including all materials required for the complete installation of the rigid insulation system.

Underlayment shall be building paper, Type 1 (No. 15) asphalt roofing felt, or rosin-sized paper.
Rigid roof insulation shall be glass fiber board conforming to ASTM Designation: C726.

Preparation.-The preparation of the deck surfaces shall conform to the manufacturer's recommendations and these special provisions. Insulation shall resist the wind uplift classification specified for the roof covering.

SINGLE-PLY MEMBRANE ROOFING

Scope.-This work shall consist of single-ply membrane roofing as indicated. Roofing system shall be a single-ply, Ethylene Propylene Diene Monomer (EPDM) synthetic-rubber sheet elastomeric membrane, installed in unbroken sheet form and fully adhered to the rigid roof insulation. Include supervision of roof insulation and sheet metalwork in connection with roofing work.

Product Data.-Submit manufacturer's product data and installation specifications of the membrane roofing system and related flashings, including pertinent flashing details. Submit sample square, 8 by 10 inches in size, of the EPDM synthetic rubber sheet. Submit sample 1/2-pint can of adhesive. Submit samples of mechanical fasteners proposed for use.

Manufacturer's Certification.-At completion of the installation, submit written certification, signed by the roofing materials' manufacturer or its authorized representative, that the materials used in the work were in accordance with these Specifications, and that they were installed properly in accordance with these specifications and the manufacturer's installation instructions and recommendations.

Quality Assurance.-Roofing shall meet Underwriter's Laboratories requirements for Class A roofing assembly and Class 60 wind uplift resistance in compliance with UL 790 "Tests for Fire Resistance of Roof Covering Materials" and UL 580 "Tests for Uplift Resistance of Roof Assemblies."

Performance Requirements.-Roofing materials shall be furnished by a manufacturer specializing in the manufacture of single-ply, EPDM synthetic-rubber sheet roofing materials. Roofing work and related flashings shall be installed by a licensed applicator approved by the manufacturer who furnishes the materials.

Guarantee.-In addition to the guarantee requirements for building work specified in these special provisions, provide the roofing manufacturer's 15-year roofing system guarantee, which shall state in essence that the roofing materials manufacturer shall, at its expense, make or cause to be made any repairs necessary to maintain the applied roof and related flashings in a watertight condition for a period of 15 years. The guarantee shall be effective from the date of the acceptance of the contract, and shall be signed by the roofing applicator and countersigned by the Contractor, and shall be submitted to the Engineer.

Examination of Roof Deck Surfaces.-Before starting the installation of any membrane roofing work, examine all surfaces on which the membrane and flashings are to be applied. Examination includes bond, moisture, and alkali testing of concrete, when applicable, as required or recommended by the manufacturer of the membrane roofing system components.

Cleaning and Preparation of Subsurfaces.-Surfaces on which the membrane roofing and flashings are to be applied shall be dry, clean of dirt and dust, paint, grease, and bond-breaking and curing compounds. Surfaces shall also be free from sharp protrusions and defective surfaces which will prevent a level and plane installation. Fill all joints, cracks, or depressions in subsurfaces with patch or underlayment material recommended by the manufacturer of the membrane system components, as required. Substrate surfaces shall be level and sloped for drainage as indicated and required.

Installation.-The single-ply membrane roofing system and related flashings shall be installed as indicated and in accordance with the specifications, installation instructions, and recommendations of the roofing materials manufacturer for a fully adhered roof system, using only workers skilled and experienced in the installation of the type of work involved.

SHEET METAL FLASHING

Scope.-This work shall consist of fabricating, furnishing and installing sheet metal flashing in accordance with the details shown on the plans and these special provisions. Sheet metal shall include metal flashings, counterflashings, straps, gutters, downspouts, roof jacks, reglets, copings, scuppers, conductor heads, and screen type vents.

Codes and standards.-Sheet metal work shall be in accordance with the requirements of the latest edition of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Standard Practice in Architectural Sheet Metal Work."

Sheet flashing.—Sheet metal shall be stainless steel 304 not less than 0.5 mm thick.

Soldering flux.-Soldering flux shall be acid type, conforming to Federal Specification: O F 506C, Type I, Form A.

Sealant.-Sealant for exposed locations shall be a silicone sealant conforming to ASTM Designation: C 920.

General.-Sheet metal shall be assembled to Sheet Metal and Air Conditioning Contractors National Association Standards. Angle bends and folds for interlocking the metal shall be made with full regard for expansion and contraction to avoid buckling or fullness in the metal after it is installed. Joints in sheet metal work shall be closed watertight unless slip joints are specifically required. Watertight joints shall be mechanically interlocked and then thoroughly soldered. Watertight joints in stainless steel or between stainless steel and other metals shall be sealed with acrylic sealant. Flashings shall have a 45 degree drip return at bottom edges. Unless otherwise shown on the plans, counterflashing shall extend not less than 100 mm over roofing or other materials protected by the counterflashing and shall be arranged so that roofing or materials can be repaired without damage to the counterflashing. Where reglets are indicated, counterflashing shall be fastened by lead wedges or snap-in flashing.

Protection.-Aluminum surfaces to be in contact with concrete, mortar, or dissimilar metals shall be given a heavy coat of coal tar paint.

ROOF DRAINAGE PIPE

Roof drainage pipe shall be Class A2, Schedule 40 galvanized steel pipe conforming to ASTM Designation: A 53, with black cast iron recessed drainage fittings. For rainwater leaders, neoprene-gasket compression couplings, Smith Blair, Dresser, or equal, may be used. The weight of the zinc coating shall be not less than 90 percent of that specified in ASTM Designation: A 53.

PAYMENT

The contract lump sum price paid for concrete canopy shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in concrete canopy, complete in place and ready for use, including all site preparation, earthwork, concrete formwork, reinforcement, falsework, and finishes in columns, footings, concrete slab for the curb islands, roof slab, parapet wall, and installation of roof drains, flashings, waterproof membranes, drain pipes, and the like, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

FALSEWORK

Falsework shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

Welding and Nondestructive Testing

Welding of steel members, except for previously welded splices and except for when fillet welds are used where load demands are less than or equal to 175 N/mm for each 3 mm of fillet weld, shall conform to AWS D1.1 or other recognized welding standard. The welding standard to be utilized shall be specified by the Contractor on the working drawings. Previously welded splices for falsework members are defined as splices made prior to the member being shipped to the project site.

Splices made by field welding of steel beams at the project site shall undergo nondestructive testing (NDT). At the option of the Contractor, either ultrasonic testing (UT) or radiographic testing (RT) shall be used as the method of NDT for each field weld and any repair made to a previously welded splice in a steel beam. Testing shall be performed at locations

selected by the Contractor. The length of a splice weld where NDT is to be performed, shall be a cumulative weld length equal to 25 percent of the original splice weld length. The cover pass shall be ground smooth at the locations to be tested. The acceptance criteria shall conform to the requirements of AWS D1.1, Section 6, for cyclically loaded nontubular connections subject to tensile stress. If repairs are required in a portion of the weld, additional NDT shall be performed on the repaired sections. The NDT method chosen shall be used for an entire splice evaluation including any required repairs.

For all field welded splices, the Contractor shall furnish to the Engineer a letter of certification which certifies that all welding and NDT, including visual inspection, are in conformance with the specifications and the welding standard shown on the approved working drawings. This letter of certification shall be signed by an engineer who is registered as a Civil Engineer in the State of California and shall be provided prior to placing any concrete for which the falsework is being erected to support.

For previously welded splices, the Contractor shall determine and perform all necessary testing and inspection required to certify the ability of the falsework members to sustain the stresses required by the falsework design. This welding certification shall be in writing, shall be signed by an engineer who is registered as a Civil Engineer in the State of California, and shall be provided prior to placing any concrete for which the falsework is being erected to support.

The Contractor's engineer who signs the falsework drawings shall also certify in writing that the falsework is constructed in conformance with the approved drawings and the contract specifications prior to placing concrete. This certification shall include performing any testing necessary to verify the ability of the falsework members to sustain the stresses required by the falsework design. The engineer who signs the drawings may designate a representative to perform this certification. Where falsework contains openings for railroads, vehicular traffic, or pedestrians, the designated representative shall be qualified to perform this work, shall have at least three years of combined experience in falsework design or supervising falsework construction, and shall be registered as a Civil Engineer in the State of California. For other falsework, the designated representative shall be qualified to perform this work and shall have at least three years of combined experience in falsework design or supervising falsework construction. The Contractor shall certify the experience of the designated representative in writing and provide supporting documentation demonstrating the required experience if requested by the Engineer.

Full compensation for falsework shall be considered as included in the contract lump sum price paid for concrete canopy and no separate payment will be made therefor.

12-1.03 CAST-IN-PLACE CONCRETE

PART 1.- GENERAL

SUMMARY

Scope.-This work shall consist of constructing cast-in-place concrete facilities in accordance with the details shown on the plans and these special provisions.

Related work.-Compressive strength concrete shall conform to the requirements in Section 90-9, "Compressive Strength," of the Standard Specifications.

SUBMITTALS

Product data.-Manufacturer's descriptive data for admixtures, expansion joint material, vapor barrier, hardener, and sealer shall be submitted for approval.

Descriptive data shall be delivered to the Engineer at the jobsite.

Form Tie Pattern.-Submit form tie patterns at columns for approval.

Sand Blast Texture.-Submit samples of medium sand blast textures for approval.

QUALITY ASSURANCE

Certificates of Compliance.-Certificates of Compliance shall be furnished for cement, reinforcement, epoxy products, and admixtures in accordance with the requirements specified in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

PART 2.- PRODUCTS

CONCRETE MATERIALS

Cement.-

Cement shall conform to ASTM Designation: C 150, Types II, or III portland cement; or Type IP (MS) Modified cement. Type IP (MS) Modified shall conform to ASTM Designation: C 595 and shall be comprised of an intimate mixture of Type II Modified cement and not more than 20 percent of a pozzolanic material.

Aggregates.-

Aggregates shall be free from deleterious coatings, clay balls and other extraneous materials.

Admixtures

Admixtures used in portland cement concrete shall be included on the Department's current list of approved admixtures, and shall conform to ASTM Designation: C 494, Types A, B, D, F or G for chemical admixtures; ASTM Designation: C 260 for air-entraining admixtures; and ASTM Designation: C 618 for mineral admixtures, except loss on ignition shall not exceed 4 percent. Properties of admixtures shall be uniform in each lot.

Coloring for concrete

Coloring for portland cement concrete shall be chemically inert, fade resistant mineral oxide or synthetic type.

FORM MATERIALS

Forms for exposed finish concrete

Forms for exposed surfaces shall be plywood, metal or other panel type materials. Plywood shall be not less than 16 mm thick and without scars, dents, and delaminations. Forms shall be furnished in largest practical pieces to minimize number of joints.

Plywood shall conform to the requirements of U. S. Product Standard PS-1 for Exterior B-B (Concrete Form) Class I.

Forms for edges of slabs shall be nominal 50 mm solid stock lumber, plywood, or metal forms.

Forms for unexposed finish concrete

Forms for unexposed finish concrete surfaces shall be plywood, lumber, metal or other acceptable material.

Forms for cylindrical columns or supports

Forms for cylindrical columns shall be metal, fiberglass reinforced plastic, paper or fiber tubes. Paper or fiber tubes shall be constructed of laminated plies using water-resistant adhesive with wax-impregnated exterior for protection against weather or moisture.

Form ties

Form ties shall be factory fabricated, removable or snapoff metal ties for use as necessary to prevent spreading of forms during concrete placement. Form ties shall have cup type inserts approximately 32 mm in diameter, tapering to 25 mm, and shall be 25 mm deep. They shall be spaced in a regular pattern, approximately 600 mm on center each way, equidistant from horizontal reveals and pour joints. Form tie plugs approximately 17 mm thick shall be set in mortar shall be set in place with mortar, slightly recessed from the surface.

Form oil

Form oil shall be commercial quality form oil which will permit the ready release of the forms and will not discolor the concrete.

REINFORCING MATERIALS

Bar reinforcement

Bar reinforcement shall conform to ASTM Designation: A 615/A 615M, Grade 60 [420], or ASTM Designation: A 706/A 706M.

Welded wire fabric

Welded wire fabric shall conform to ASTM Designation: A 185.

Bar supports

Bar supports for reinforcement shall be precast mortar blocks or ferrous metal chairs, spacers, metal hangers, supporting wires, and other approved devices of sufficient strength to resist crushing under applied loads.

EPOXY

General.-Epoxy shall be furnished as 2 components which shall be mixed together at the site of the work.

Epoxy resin adhesive

Epoxy resin adhesive shall conform to State of California Specification No. 8040-21M-08 or other epoxy suitable for bonding new concrete to old.

Epoxy mortars

Epoxy mortar and epoxy mortar surface treatment shall consist of a commercial quality, trowelable mixture consisting of epoxy and sand. Epoxy shall have a pull-off strength of not less than 6895 MPa and a 90-percent cure in 24 hours. Epoxy shall be of the type that requires no primer as a bonding agent.

Sand

Sand for use in epoxy mortars shall be clean and shall have a moisture content of not more than 0.50-percent when tested in accordance with California Test 226.

Sand for epoxy mortar surface treatment shall be graded such that 100-percent passes the 150 µm sieve.

RELATED MATERIALS**Anchor bolts, nuts, and washers**

Nonheaded anchor bolts shall conform to ASTM Designation: A 36/A 36M, with a minimum hook length of 6.2 diameters.

Headed anchor bolts shall conform to ASTM Designation: A 307.

Threaded rods shall conform to ASTM Designation: A 572.

Nuts shall conform to ASTM Designation: A 563M, Grade A.

Washers for anchor bolts shall be commercial quality.

Exposed anchor bolts, nuts, and washers shall be hot dipped galvanized.

Expansion joint material

Expansion joint material shall be commercial quality asphalt impregnated pressed fiber sheets, 13 mm minimum thickness.

Vapor barrier

Vapor barrier shall be commercial quality polyethylene sheets not less than 0.15 mm thick.

Bond breaker

Bond breaker shall be Type I asphalt saturated organic felt or such other material approved by the Engineer.

Nonskid abrasive aggregate

Nonskid abrasive aggregate shall be commercial quality aluminum oxide, silicon carbide, or almandite garnet grit particles; screen size 12-30 or 14-36.

Type A control joints

Type A control joints shall be commercial quality, preformed, T-shaped plastic strips with detachable top flange.

Keyed construction joint forms

Keyed construction joint forms shall be commercial quality, galvanized metal or plastic, factory fabricated construction joint forms. Forms shall produce a rabbeted key type joint.

Divider and edger strips

Divider and edger strips shall be foundation grade redwood.

Mortar

Mortar shall consist of one part cement to 2 parts clean sand and only enough water to permit placing and packing.

Curing compound

Curing compound shall be a non-pigmented curing compound with fugitive dye conforming to the requirements of ASTM Designation: C 309, Type 1-D, Class A.

Concrete hardener

Concrete hardener shall be commercial quality water borne penetrating type magnesium fluosilicate, zinc fluosilicate or combination thereof.

Splash block

Splash blocks shall be precast concrete splash blocks with depressed runoff trough. Splash blocks shall be 305 mm x 610 mm x 89 mm in size unless otherwise shown on the plans.

ADMIXTURES

General.-Admixtures shall be used when specified or ordered by the Engineer and may be used at the Contractor's option to conserve cement or to facilitate any construction operation.

Calcium chloride shall not be used in any concrete.

Admixtures shall be combined with concrete materials by methods that produce uniform properties throughout the concrete.

If more than one admixture is used, said admixtures shall be compatible with each other so that the desirable effects of all admixtures will be realized.

Mineral admixtures may be used to replace up to 15 percent of Type II portland cement provided the weight of mineral admixture used is not less than the weight of cement replaced. Mineral admixtures shall not be used to replace Type IP (MS) Modified or Type III cements. Chemical admixtures may be used to reduce up to 5 percent of the portland cement except that the cement content shall not be less than 300 kg/m³. When both chemical and mineral admixtures are used with Type II cement, the weight of cement replaced by mineral admixture may be considered as cement in determining the resulting cement content.

Mineral admixtures will be required in the manufacture of concrete containing aggregates that are determined to be "deleterious" or "potentially deleterious" when tested in accordance with ASTM Designation: C 289. The use of mineral admixture in such concrete shall conform to the requirements in this section except that the use of set retarding admixtures will not be permitted.

When the use of a chemical admixture is specified or is ordered by the Engineer, the admixture shall be used at the rate specified or ordered. If no rate is specified or ordered, or if the Contractor uses a chemical admixture for his own convenience, the admixture shall be used at the dosage normally recommended by the admixture manufacturer.

When air-entrainment is specified or is ordered by the Engineer, the air-entraining admixture shall be used in amounts to produce concrete having the specified or ordered air content as determined by California Test 504. If the Contractor uses air-entrainment for his own convenience, the average air content shall not exceed 4 percent and no single test shall exceed 5 1/2 percent.

Chemical admixtures and air-entraining admixtures shall be dispensed in liquid form. Dispensers shall have sufficient capacity to measure at one time the total quantity required for each batch. If more than one liquid admixture is used in the concrete, a separate measuring unit shall be provided for each liquid admixture and dispensing shall be such that the admixtures are not mixed at high concentrations. When air-entraining admixtures are used with other liquid admixtures, the air-entraining admixtures shall be the first to be incorporated into the mix. Unless liquid admixtures are added to premeasured water for the batch, they shall be discharged to flow into the stream of water so that the admixtures are well dispersed throughout the batch.

BAR REINFORCING STEEL

Bending.-Reinforcing steel bars shall accurately conform to the dimensions shown on the plans.

Bars shall be bent or straightened in a manner that will not crack or break the material. Bars with kinks or improper bends shall not be used.

Hooks, bends and splices shall conform to the provisions of the Building Code Requirements for Reinforced Concrete of the American Concrete Institute.

MIXING AND TRANSPORTING CONCRETE

General.-When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be complete within 1 1/2 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of cement to the aggregates.

The temperature of mixed concrete, immediately before placing, shall be not less than 10°C nor more than 32°C.

Truck mixers or agitator shall be equipped with electrically or mechanically actuated revolution counters by which the number of revolutions of the drum or blades may readily be verified. The counters shall be of the continuous-registering type, which accurately register the number of revolutions and shall be mounted on the truck so that the Engineer may safely and conveniently inspect them from alongside the truck. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, a time less than 1 1/2 hours may be required.

When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be complete within one hour after the introduction of cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C, or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

Each load of concrete for the work shall be accompanied by a trip ticket, a copy of which shall be delivered to the Engineer at the jobsite. The trip ticket shall show volume of concrete, weight of cement and aggregates, quantity of each admixture, quantity of water including water added at the jobsite, time of day the concrete is batched, and revolution counter readings on transit mix trucks at the times the truck is charged and unloaded.

PART 3.- EXECUTION

PREPARATION

Existing concrete construction.-Where fresh concrete joins existing or previously placed concrete or masonry, the contact surfaces of the existing or previously placed material shall be roughened, cleaned, flushed with water and allowed to dry to a surface dry condition immediately prior to placing the fresh concrete. The roughened surface shall be no smoother than a wood trowelled surface. Cleaning of the contact surfaces shall remove laitance, curing compounds, debris, dirt and such other substances or materials which would prevent bonding of the fresh concrete.

Abrasive blast methods shall be used to clean horizontal construction joints to the extent that clean aggregate is exposed.

Exposed reinforcing steel located at the contact surfaces which is to be encased in the fresh concrete shall be cleaned to remove any substance or material that would prevent bonding of the fresh concrete.

Forms.-Forms shall be mortar tight, true to the dimensions, lines, and grades shown on the plans, securely fastened and supported, and of adequate rigidity to prevent distortion during placing of concrete.

Forms for exposed surfaces shall be constructed with triangular fillets not less than 19 mm x 19 mm attached so as to prevent mortar runs and to produce smooth straight chamfers at all sharp edges of the concrete.

Form fasteners shall be removable without chipping, spalling, heating or otherwise damaging the concrete surface. Form ties shall be removed to a depth of at least 25 mm below the surface of the concrete.

The inside surfaces of forms shall be cleaned of all dirt, mortar and foreign material. Forms shall be thoroughly coated with form oil prior to use.

Forms shall not be stripped until at least 40 hours after placing concrete, except soffit forms and supports shall not be released or removed until at least 10 days after placing concrete.

Anchorage and embedded items shall be placed and rigidly secured at their planned locations prior to placing concrete.

Reglets or embedded flashing shall be installed on concrete forms before the concrete is placed.

Redwood dividers shall have 4 mm x 89 mm galvanized nails partially driven into both vertical faces at 450 mm on centers.

Vapor barrier.-Vapor barrier shall be lapped 150 mm and securely taped at splices. Vapor barrier shall be protected with a 75 mm layer of clean uncompacted sand cover.

Unless otherwise shown on the plans, vapor barrier shall be placed under portions of the floor slab scheduled to receive finish flooring.

Placing reinforcing steel.-Reinforcing steel bars shall be accurately placed to the dimensions shown on the plans.

Bar reinforcement conforming to ASTM Designation: A 615/A 615M, Grade 60 [420], or A 706//A 706M shall be lapped at least 45 diameters.

Bars shall be firmly and securely held in position by means of wiring and approved bar supports. The spacing of supports and ties shall prevent displacement of the reinforcing or crushing of supports.

Tie wire shall be clear of concrete formwork and concrete surfaces.

All reinforcing steel shall be in place and inspected before concrete placement begins. Placing of bars on fresh layers of concrete will not be permitted.

Within areas where epoxy-coated reinforcement is required, tie wire and bar chairs or other metallic devices used to secure or support the reinforcement shall be plastic-coated or epoxy-coated to prevent corrosion of the devices or damage to the coated reinforcement.

Ground bar.-A continuous reinforcing steel bar shall be installed in the building foundation at the location indicated on the plans for the electrical ground bar. The use of epoxy coated reinforcing bar is not permitted. The end of the ground bar shall extend beyond the concrete surface and shall be protected from damage by construction operations.

Hydronic tubing.-Hydronic tubing shall be securely fastened to the bar reinforcing using nylon ties. The hydronic heating system shall be fully tested prior to placing concrete.

PLACING CONCRETE

General.-Concrete shall be placed and consolidated by means of internal vibrators to form dense, homogeneous concrete free of voids and rock pockets.

Forms and subgrade shall be thoroughly moistened with water immediately before placing concrete.

Concrete shall be placed as nearly as possible to its final location and the use of vibrators for extensive shifting of the concrete will not be permitted.

Concrete shall be deposited and consolidated in a continuous operation within limits of construction joints, until the placing of the panel or section is completed.

When concrete is to be placed in large areas requiring more than two pours, concrete shall be placed in alternate long strips between construction joints and the final slab infilled.

Vibrators used to consolidate concrete containing epoxy-coated bar reinforcement shall have a resilient covering to prevent damage to such reinforcement.

At columns, concrete shall be placed so that the placement coincides with horizontal reveals, at the locations shown on the drawings.

FINISHING CONCRETE SURFACES

Finishing unformed surfaces.-Slabs shall be placed full thickness to finish elevation and leveled to screeds by use of long straightedges. The screeds shall be set to grade at approximately 1.8 meter centers. After leveling, screeds shall be removed and the surface shall be floated with wooden floats.

Type A control joint strips shall be inserted into the floated concrete so that the bottom of the top flange is flush with the finish elevation. Strips shall be standard manufactured lengths and shall be placed on an approximate straight line. The top flange of the strips shall be removed after the concrete has set and cured.

The floated surface shall be trowelled with steel trowels. Troweling shall form a dense, smooth and true finish. Walkways, pedestrian ramps, stairs and outdoor slabs for pedestrian traffic shall be given a non-slip broom finish unless a different finish is called for on the plans or in these special provisions.

The application of cement dust coat will not be permitted.

Steel trowel finish and broom finish will not be required for slabs to receive exposed aggregate finish nor for slabs to be covered with ceramic tile.

Concrete floor surfaces to receive ceramic tile shall be floated to grade and then, before final set of the concrete, the floated surfaces shall be roughened with stiff bristled brushes or rakes.

Finished surfaces of floor slabs shall not deviate more than 3 mm from the lower edge of a 3-meter long straight edge.

Finishing formed surfaces.-Formed concrete surfaces shall be finished by filling holes or depressions in the surface, repairing all rock pockets, and removing fins. All surfaces of formed concrete exposed to view shall have stains and discolorations removed, unsightly bulges removed, and all areas which do not exhibit the required smooth, even surface of uniform texture and appearance shall be sanded with power sanders or other approved abrasive means until smooth, even surfaces of uniform texture and appearance are obtained.

Cement mortar, patching and finishing materials used to finish exposed surfaces of concrete shall closely match the color of surrounding surfaces.

Surfaces exposed to view at the Concrete Canopy shall receive a medium texture sand blast finish.

Nonskid abrasive aggregate finish.-Where shown on the plans, walkways shall receive a nonskid abrasive aggregate (grit) finish. The grit shall be applied uniformly at the rate of not less than 1.5 kg/m² and tamped into the floated concrete surface while the concrete is plastic. The grit shall be buried about 0.7-diameter of each particle into the concrete.

CURING CONCRETE

General.-Freshly placed concrete shall be protected from premature drying and excessive cold or hot temperatures.

Initial curing of floor slabs shall start as soon as free water has disappeared from the concrete surface. The concrete shall be kept continuously wet by application of water for not less than 7 days after the concrete has been placed.

Cotton mats, rugs, carpets, or sand blankets may be used as a curing medium to retain the moisture during the curing period. Curing materials that will stain or discolor concrete shall not be used on surfaces exposed to view.

Prior to placing the curing medium, the entire surface of the concrete shall be kept damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. At the expiration of the curing period, the concrete surfaces shall be cleared of all curing mediums.

Concrete surfaces, other than floor slabs, shall be kept moist for a period of at least 5 days by leaving the forms in place or by covering the exposed surfaces using moist rugs, cotton mats or other curing materials approved by the Engineer.

Concrete curbs, sidewalks, collars, and gutter depressions may be cured with a curing compound.

PROTECTING CONCRETE

General.-Concrete shall not be placed on frozen or frost covered surfaces.

Concrete shall be protected from damage due to rain, freezing or inclement weather, and shall be maintained at a temperature of not less than 4°C for 72 hours. When required by the Engineer, the Contractor shall provide a written outline of his proposed methods of protecting concrete.

Vehicles, equipment, or concentrated loads weighing more than 140 kg individually and material stockpiles weighing more than 240 kg/m² will not be permitted on the concrete within 10 calendar days after placing.

SPECIAL TREATMENTS

Concrete hardener.-Chemical concrete hardener shall be applied to the floor surfaces shown on the plans, prior to the application of concrete sealer. Surfaces shall be clean and dry before the application of hardener.

The solution shall be applied in accordance with the manufacturer's instructions.

After the hardener has dried, the surface shall be mopped with water to remove encrusted salts.

Concrete sealer.-Concrete sealer shall be applied to the concrete surfaces designated on the plans in accordance with the manufacturer's instructions for heavy duty use. The sealer shall be applied to dry concrete surfaces.

Epoxy resin adhesive.-Epoxy resin adhesive shall be applied to concrete surfaces shown on the plans. Epoxy resin adhesive shall be mixed and applied in accordance with the manufacturer's recommendations.

Epoxy mortars.-Epoxy for use as a binder in epoxy mortars shall be thoroughly mixed together before the aggregate is added, and unless otherwise specified, the mix proportions shall consist of one part binder to approximately 4 parts of aggregate, by volume.

All surfaces against which epoxy mortars are to be applied shall be free of rust, paint, grease, asphalt, and loose or deleterious material.

PAYMENT

Full compensation for concrete work and related items of work specified in this specification shall be considered as included in the contract lump sum prices paid for Prefabricated Guard House and the Concrete Canopy, and no separate payment will be made therefor.

12-1.04 SLIDING GATE

The Contractor shall furnish and install chain link fence type cantilevered sliding gates, complete with electrically controlled gate operators and vehicle detection systems, to conform with the details shown on the plans and as specified in these special provisions.

Attention is directed to the provisions in "Lighting and Electrical Systems," of these special provisions for the interfaces of the cables, conduits and hardware requirements to integrate the gate installation and operation with the guard house security system.

Gates shall be equipped with an electrically operated gate control hardware and vehicle detection systems, as manufactured by Automatic Gate Supply (AGS), 25583 Avenue Stanford, Valencia CA 91355 USA, Phone 1-661-294-1450 or Toll Free 1-800-423-3090, FAX 1-661-294-1401, or Elite Access Systems, Inc., 25741 Commercentre Drive, Lake Forest, CA 92630 or equal.

The gate operators and vehicle detection systems shall include electrical connections to the guard house security systems specified in "Lighting and Electrical Systems," of these special provisions.

The gates shall be operated by the card key at the entry pedestal, by a manually operated button in the guard gate and by a manually operated button in the security console in Building 22. The exit gate shall be operated automatically by a vehicle loop detector and by a manual button in both the guard house and the security console in Building 22. Each gate shall have a control that will allow it to be locked open

The Contractor shall furnish and install two control boards in the horizontal counters in the Guard House. One control board shall operate the "In" gate, and the other the "Out" gate.

The Contractor shall furnish and install loop detector systems in the paved surfaces as shown on the plans for Entry Loop, Safety Loop, and Exit Loop functions. The Contractor shall connect the loop detector system to the electric power and the control boards.

The control boards shall provide for the integrated operation of the gates, and they shall also connect to the Coast Guard Base security system as noted elsewhere in these special provisions. The control boards shall contain all required input and output functions to the gate operators. The control boards shall include solid state motor controls, spike suppressors, safety alarms, and all other features required for a complete gate operation system."

The cantilevered sliding gates shall be (Type CL-2.4, Black vinyl-Clad) with barbed wire extension arms, and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications, and these special provisions.

Barbed wire supporting arms (extension arms) shall extend upwards from the tops of the fence posts at an approximate angle of 45 degrees and shall be fitted with clips or other suitable means for attaching 3 lines of barbed wire. The top outside wire shall be attached to the extension arm at a point approximately 300 mm above the top of the chain link fabric and 300 mm out from the fence line. The other wires shall be attached to the arm uniformly between the top of the fence and the top outside wire.

Barbed wire shall conform to the provisions in Section 80-3.01C, "Barbed Wire," of the Standard Specifications.

The chain link fabric shall be 9-gage (3.76 mm), Type IV, Class B, bonded vinyl coated fabric, conforming to the requirements in AASHTO Designation: M 181. The color shall be black.

The strength of the bond between the coating material and steel of the bonded vinyl coated chain link fabric shall be equal to or greater than the cohesive strength of the polyvinyl chloride (PVC) coating material.

PAYMENT

The contract unit price paid for sliding gate of the sizes designated in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing of the cantilevered sliding gate complete with electrically operated gate control hardware, vehicle detector systems, and electrical connections to the guard house security systems, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____
2. Address of joint venture _____
3. Phone number of joint venture _____
4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

 - a. Describe the role of the MBE firm in the joint venture. _____
 - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

5. Nature of the joint venture's business _____

6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? _____
8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).
 - a. Profit and loss sharing.
 - b. Capital contributions, including equipment.

- c. Other applicable ownership interests.
9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:
- a. Financial decisions _____
 - b. Management decisions, such as:
 - (1) Estimating _____
 - (2) Marketing and sales _____
 - (3) Hiring and firing of management personnel _____
 - (4) Purchasing of major items or supplies _____
 - c. Supervision of field operations _____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

Name of Firm	Name of Firm
Signature	Signature
Name	Name
Title	Title
Date	Date

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
 - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
 - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
 - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
 - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
 - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
 - b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
 - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
 - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
 - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
 - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through

independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
 - a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
 - a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).
- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;

- (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
 - d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
 - e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

- (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
- (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing

work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

- (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.
- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.
- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure

to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

Notice To All Personnel Engaged On Federal-Aid Highway Projects

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water

Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the

meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or

employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

Goal for Women (applies nationwide).....(percent) 6.9

The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

	Goal (Percent)
174 Redding, CA:	
Non-SMSA Counties	6.8
CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama.	
175 Eureka, CA	
Non-SMSA Counties	6.6
CA Del Norte; CA Humboldt; CA Trinity.	
176 San Francisco-Oakland-San Jose, CA:	
SMSA Counties:	
7120 Salinas-Seaside-Monterey, CA	28.9
CA Monterey.	
7360 San Francisco-Oakland	25.6
CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.	
7400 San Jose, CA	19.6
CA Santa Clara.	
7485 Santa Cruz, CA.	14.9
CA Santa Cruz.	
7500 Santa Rosa, CA	9.1
CA Sonoma.	
8720 Vallejo-Fairfield- Napa, CA	17.1
CA Napa; CA Solano	
Non-SMSA Counties	23.2
CA Lake; CA Mendocino; CA San Benito	
177 Sacramento, CA:	
SMSA Counties:	
6920 Sacramento, CA	16.1
CA Placer; CA Sacramento; CA Yolo.	
Non-SMSA Counties	14.3
CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	
178 Stockton-Modesto, CA:	
SMSA Counties:	
5170 Modesto, CA	12.3
CA Stanislaus.	
8120 Stockton, CA	24.3
CA San Joaquin.	
Non-SMSA Counties	19.8
CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne.	

		Goal (Percent)
179	Fresno-Bakersfield, CA	
	SMSA Counties:	
	0680 Bakersfield, CA CA Kern.	19.1
	2840 Fresno, CA CA Fresno.	26.1
	Non-SMSA Counties CA Kings; CA Madera; CA Tulare.	23.6
180	Los Angeles, CA:	
	SMSA Counties:	
	0360 Anaheim-Santa Ana-Garden Grove, CA CA Orange.	11.9
	4480 Los Angeles-Long Beach, CA CA Los Angeles.	28.3
	6000 Oxnard-Simi Valley-Ventura, CA CA Ventura.	21.5
	6780 Riverside-San Bernardino-Ontario, CA. CA Riverside; CA San Bernardino.	19.0
	7480 Santa Barbara-Santa Maria-Lompoc, CA CA Santa Barbara.	19.7
	Non-SMSA Counties CA Inyo; CA Mono; CA San Luis Obispo.	24.6
181	San Diego, CA:	
	SMSA Counties	
	7320 San Diego, CA. CA San Diego.	16.9
	Non-SMSA Counties CA Imperial.	18.2

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 2.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the

Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.